News about

B. F. Goodrich Chemical *raw materials*

INTRODUCED only a year ago, low-temperature polymerized Hycar 1042 has become the standard for tough applications.

Hycar 1042 has the same high resistance to oil and age as Hycar 1002 and 1012. In addition, it provides higher tensile strength and increased elongation—gives that extra margin of safety so important to meet tough specifications.

Check these advantages—see how they can help your operations:

- **Higher tensile strength**
- **Greater elongation**
- **Improved milling**
- **Smoother extruding and calendering**
- **Better solubility for cements**
- **Outstanding oil and age resistance**

For information and technical advice about "Cold" Hycar 1042, please write Dept. HB-9, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Hycar
American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

Pick A *or* O *or* I *or* E

Each **Philblack*** *has a specialty!*

What's cooking? No matter what rubber product you manufacture, there's a Philblack that's just your dish!

Philblack A . . . a real treat for rubber molders! Easy-processing MAF black turns out accurate moldings, smooth tubings. Preserves pliancy. Disperses heat.

Philblack O . . . an HAF black for tough jobs. In tire treads it guards against abrasion and cut-and-crack growth. Reduces static electricity.

Philblack I . . . the new ISAF black (Intermediate Super Abrasion Furnace) that's ready to deliver *unusually high abrasion qualities* at a price that keeps your products *competitive*.

Philblack E . . . SAF black for *mileage miracles!* The top in Super Abrasion Furnace Black. Tire treads made with Philblack E wear up to 42% longer!

To find out which Philblack can do the best job for you, consult your technical sales representative or write our Akron Laboratory. Order Philblacks in carload or truckload lots.

PHILLIPS CHEMICAL COMPANY

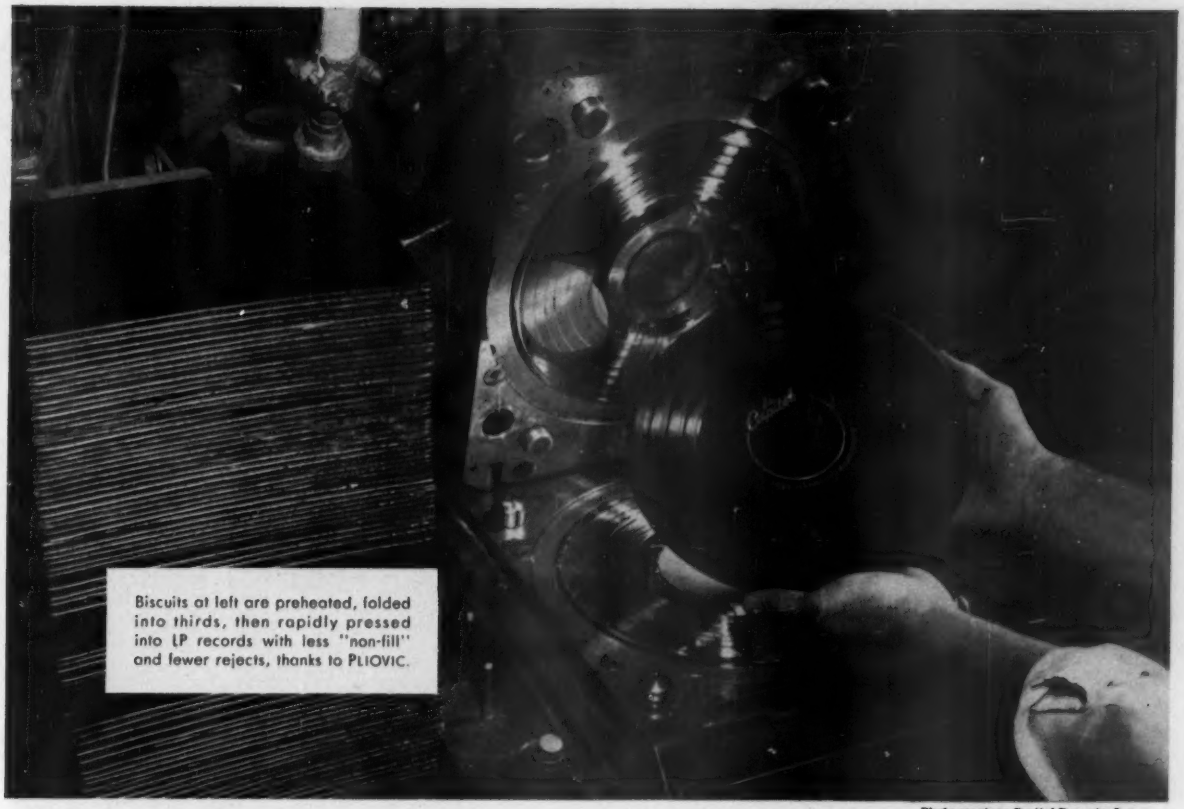
PHILBLACK SALES DIVISION

318 WATER STREET • AKRON 8, OHIO

PHILBLACK EXPORT SALES DIVISION • 80 BROADWAY • NEW YORK 8, N. Y.

* A Trademark

The Philblacks are manufactured at Borger, Texas. Warehouses in Akron, Boston, Chicago, and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.



Biscuits at left are preheated, folded into thirds, then rapidly pressed into LP records with less "non-fill" and fewer rejects, thanks to PLIOVIC.

Photo courtesy Capitol Records, Inc.

Record Maker Reports:

FEWER REJECTS with PLIOVIC

SUCCESSFUL production of LP records calls for a relatively soft, free-flowing vinyl compound. Adequate flow is necessary for good mold reproduction in a fast pressing cycle. Too much flow, however, causes trouble through the compound running away during pressing with "non-fill" and too many rejects resulting.

Such was the problem of this famous maker of records. The standard compound flowed too freely – the number of rejects was too high. But the answer was found in PLIOVIC by Goodyear. By modifying the base resin with up to 25% PLIOVIC, the compound was stiffened and the flow decreased to just the rate needed. Net result has been the minimum in rejects from "non-fill."

PLIOVIC may well be the answer to your production problems, too. Best way to find out is to try PLIOVIC with the helpful assistance of your vinyl-wise Chemical Division representative. For full information and samples, write to:

Goodyear, Chemical Division, Akron 16, Ohio

Chemigum, Pliobond, Pliolite, Pliovic–
T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMICAL
GOODYEAR
DIVISION

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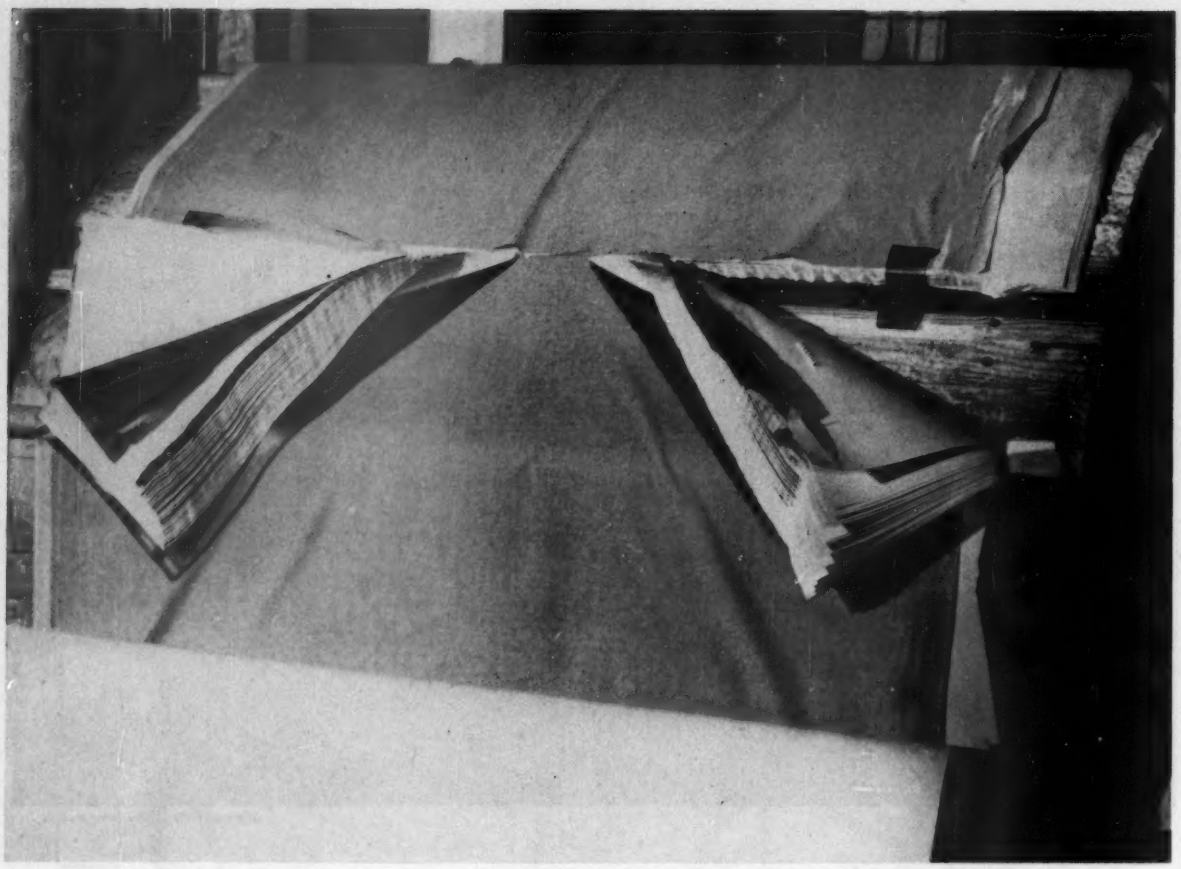
Use-Proved Products – CHEMIGUM · PLIOBOND · PLIOLITE · PLIOVIC · WING-CHEMICALS – The Finest Chemicals for Industry



LINERETTE PLIES UP PROFITS

Linerette separating paper plied up with frictioned stock before being cut in the clicking operation, saves time and money. Since 1925 Linerette, the specially processed separating paper, has been used with steadily increasing acceptance. It assures clean, fast separation without adhesion and contains no oil or wax. Here is how Linerette can help you:

- Preserves tack.
- Protects lightweight stock in shipment—no fabric needed.
- Keeps stock free of cloth marks or impressions.
- Clippings may be mixed with scrap and worked away when used in die-cutting operations.
- Where cleanliness is essential, Linerette is a low cost lining for trays and containers.
- Stocks can be calender-fed into it.
- Used with most types of lightweight stocks in sheets or strips.

Linerette is available in any width up to and including 54", in rolls of 9", 11½", 13" and 15" diameters, on cores of 3" i.d. The yield is approximately six square yards to the pound. A 9" roll contains 375 linear yards and a 15" diameter about 1150 linear yards. Ask for a sample today, just specify desired width.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U. S. A.
Cable Address: "BLUELINER"

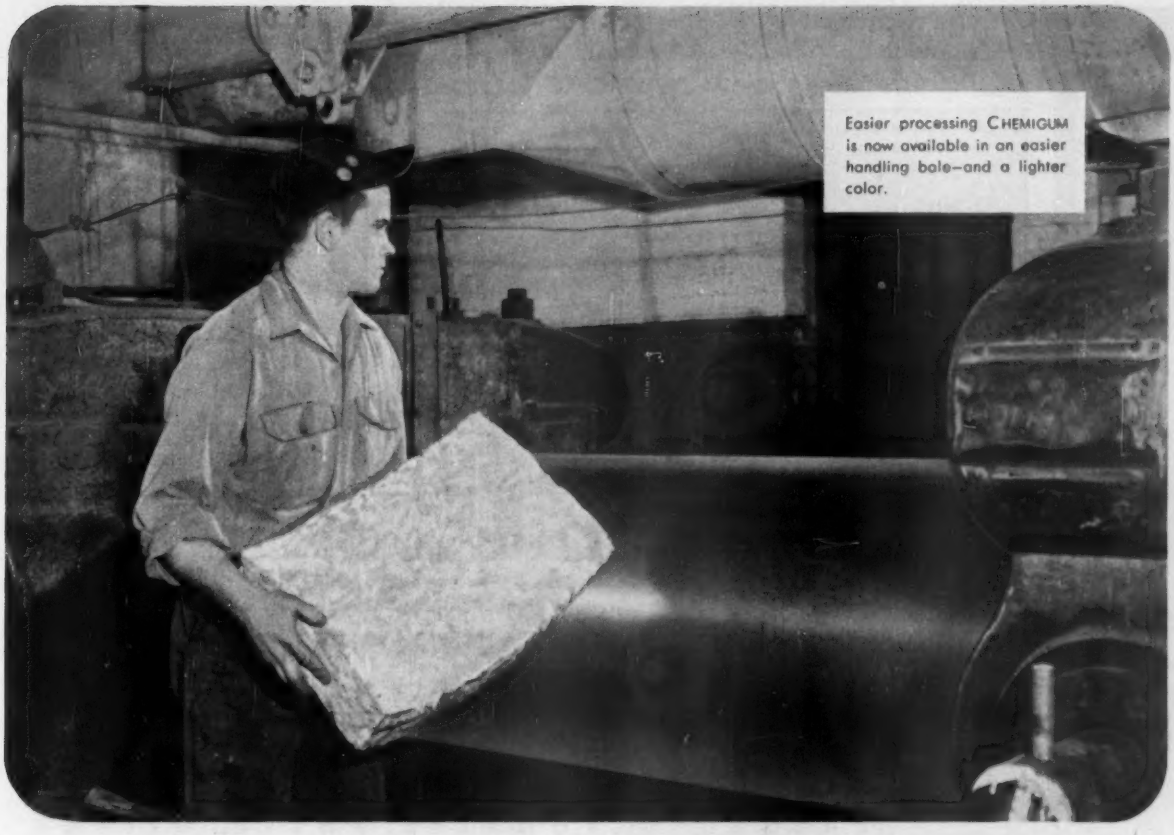
GET THE FULL STORY ON CLIMCO PROCESSING

Illustrated booklet tells about Climco Liners and Linerette separating paper. Tells how to get better service from liners. Write for your copy now.

CLIMCO

LINERETTE
INTERLEAVING PAPER

MADE BY THE MANUFACTURERS OF *CLIMCO* PROCESSED LINERS



NOW—LIGHTER COLORED CHEMIGUM

in a lighter weight bale

BASICALLY the same, yet visibly different are two new types of CHEMIGUM—Goodyear's easier processing nitrile rubber.

CHEMIGUM N6 and CHEMIGUM N7 are the same basic polymers as their respective forerunners, CHEMIGUM "30" N4NS and CHEMIGUM "50" N4NS. After-polymerization process changes give you these new, oil-resistant rubbers in a much lighter—almost white—color and in a much lighter—50 pound—bale.

Now, you can add new ease in handling and new possibilities in compounding to the established advantages of use-proved CHEMIGUM. CHEMIGUM is the easiest processing of the nitrile rubbers. You get faster "breakdowns" easier. And you get them with physical, chemical and electrical properties that equal or surpass those of any similar rubbers.

With the new CHEMIGUM, you can meet virtually any specification for oil-resistant compounds easily and profitably. Just try it and see. For details, write: Goodyear, Chemical Division, Dept. I-9419, Akron 16, Ohio.

CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Pliovic—
T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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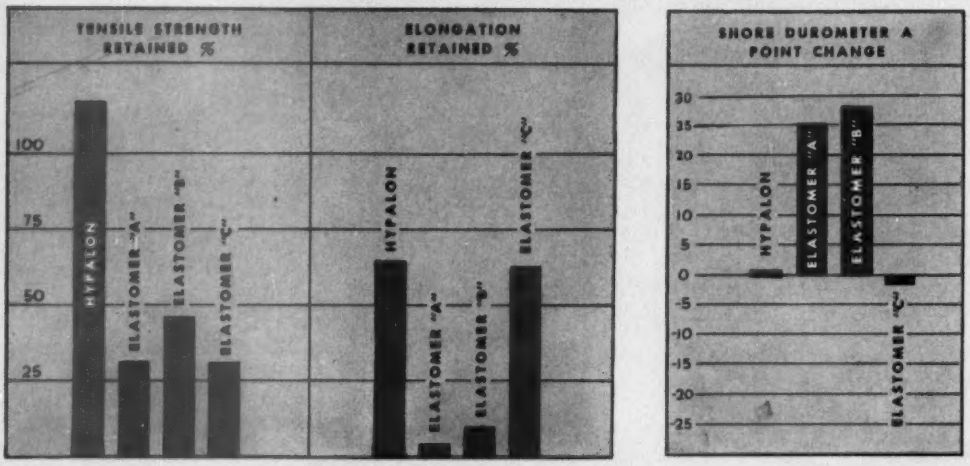
Use-Proved Products—CHEMIGUM • PLIOBOND • PLIOLITE • PLIOVIC • WING-CHEMICALS—The Finest Chemicals for Industry

HEAT AGING TESTS SHOW

HEAT AGING CHARACTERISTICS OF ELASTOMERS, 14 DAYS AT 257°F.



Heat aging tests were conducted in circulating air ovens to determine any changes in three important properties: tensile strength, elongation, and Shore durometer hardness.

DU PONT HYPALON*

CHLOROSULFONATED POLYETHYLENE

gives superior high-temperature service

The resistance of Du Pont "Hypalon" chlorosulfonated polyethylene to degradation from heat suggests a wide variety of uses in the rubber industry —for "Hypalon" alone, as well as in blends with other elastomers. Steam hose covers, for example, require the ability to stand up through long service at high temperatures. Many other uses are indicated by this property of Du Pont "Hypalon." Among them are included spark-plug boots, gaskets, O-rings, electrical insulation and jacketing, diaphragms, conveyor belt covers and molding forms and bags.

And heat resistance is only one of a unique combination of properties "Hypalon" offers. These properties point to such varied uses as automobile-tire sidewalls, automotive weather stripping, coated fabrics, footwear, floor coverings, linings for chemical handling equipment and acid hose.

Perhaps Du Pont "Hypalon"—or a blend including "Hypalon"—can help you develop a new or improved product. "Hypalon" is now available in limited commercial quantities.

ONLY "HYPALON" OFFERS *ALL* THESE OUTSTANDING PROPERTIES

- **COMPLETE OZONE RESISTANCE**
- **EXCELLENT ABRASION RESISTANCE**
- **EXCELLENT WEATHER RESISTANCE**
- **GOOD HEAT RESISTANCE**—Suitable for continuous service up to 250°F. and intermittent service at higher temperatures.
- **EXCELLENT CHEMICAL RESISTANCE**
- **UNLIMITED COLOR POSSIBILITIES.** Does not require carbon black to achieve maximum physical properties.
- **EXCELLENT FLEX LIFE**

*REG. U.S. PAT. OFF.

FOR FURTHER INFORMATION: Send today for technical literature on the properties, applications and compounding of Du Pont "Hypalon." Or, if you prefer, a Du Pont technical representative will call at your convenience.

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 639 Du Pont Bldg., Wilmington 98, Delaware

I am interested in "Hypalon" for _____. Please ( ) send me literature. ( ) Have your technical representative call.

*Name*_____ *Title*_____

*Firm*_____

*City*_____ *State*_____

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REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . *THROUGH CHEMISTRY*

Polychemicals
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PLASTICS • CHEMICALS

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

For Cutting

Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured

Gang Dies Our Specialty

- Accuracy to close Tolerances
- Durability
- Genuine Understanding of the problems of rubber goods manufacturers

MALLET HANDLE DIES

PURPOSE — For those who have no machinery and do not wish to purchase any. For Cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from bolts or not.

SERVICE—One to three days.

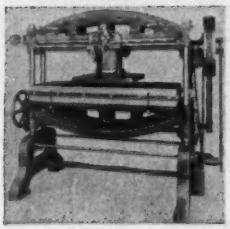
STEEL RULE CUTTING DIES

Used on Die Cutting Press, Printing Press or Power Press

PURPOSE — Especially suited for cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE—Low in cost. Suitable for long production runs. It is necessary to cut from rectangular sheets which are fed into the press.

SERVICE—One day service.



STEEL RULE CLICKER DIES

Use On Clicker Machine or Dinker Press

PURPOSE—For Cutting Rubber, Neoprene, Plastics, etc.

ADVANTAGE — More reasonably priced than the all steel dies. Recommended for small and medium quantities where cost of an all steel die is not warranted.

SERVICE—One day service.

ALL STEEL DIES

Use On Clicker Machine or Beam Press or Power Press

PURPOSE—For Cutting—Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from rolls without first cutting into sheets.

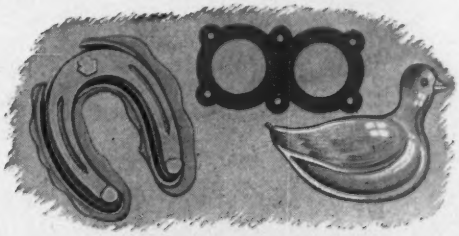
SERVICE—One to three day service on dies.

DIE CUTTING SERVICE

PURPOSE—For those who prefer to have their cutting done by others.

ADVANTAGE—We can die cut your product for you on our own presses rapidly and economically at a low "per thousand" cost.

SERVICE—One to three days.



Dies for cutting
Gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

SAME DAY SERVICE

ACCURATE

STEEL RULE DIE MANUFACTURERS

24-28 West 21st Street, New York 10, N. Y. CHelsea 2-0860-1

Subsidiaries: American Fabricators; Interstate Die Cutting Co., Inc.

Intelligent Service to the Rubber Goods Industry for Over 22 Years

INCREASE PLATEN PRESSURE
45% to 76%

With no change in your present hydraulic lines

...With the NEW ADAMSON UNITED BARREL PRESS

The new Adamson circular-side-plate, or Barrel Press is designed for high pressure molding of synthetic rubber and rubber plastic products. It provides pressures as high as 1800 pounds per sq. in., or approximately that required for light metal forming, with no change in the hydraulic lines that are now operating conventional, low pressure, rod-type presses.

The new Adamson Barrel Press meets the need for close tolerance, high pressure press work, with a minimum of deflection and resultant "flash" in the manufacture of items such as motor mounts, gas masks, crash helmets, carburetor diaphragms and other molded products. Present sizes range from 12" through 32", with larger sizes available to specification.

We believe you will be interested in the economies the Adamson Barrel Press can effect in your operation from the standpoint of both scrap reduction and accelerated product output. Your request for further information will not obligate you. Why not write today?

ADAMSON UNITED COMPANY

AKRON 4, OHIO

BRANCH OFFICES IN PRINCIPAL CITIES

Subsidiary of United Engineering and Foundry Company

You NEVER have to BABY

Your Adhesives with

TY·PLY "Q" or "3640"

YOURS FOR CONSISTENTLY DEPENDABLE SUPERIOR ADHESION OF NATURAL RUBBER TO METAL

TY-PLY "Q" or "3640" is your perfect answer for a wide variety of natural rubber mechanical goods that need reliably consistent adhesion to metals. Insensitive to varying processing conditions and materials variability. Do not need exacting control or special technique and preparation.

TY-PLY (S) for bonding Neoprene

TY-PLY (BN) for bonding N-types

TY PLY will adhere most vulcanizable rubber compounds to almost any clean metal surface

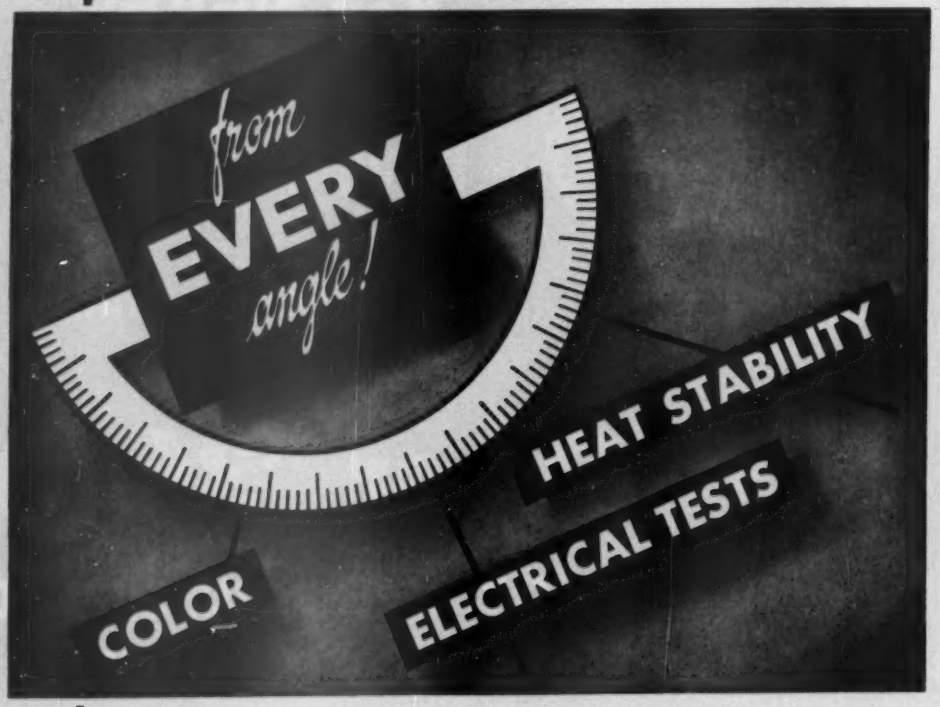
Marbon

MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

TY-PLY has stood the test of time . . . since '39



PIGMENT NO. 33

for Compounding

VINYLS AND SYNTHETIC RUBBER

Sample and technical data sent promptly on request

SOUTHERN CLAYS, Inc.

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NEW YORK 6, N. Y.

Whatever your roll requirements—whether for conventional applications or for special or unusual ones—consult us.

Our staff of experienced engineers, metallurgists and seasoned roll makers, plus the unmatched facilities of our 6 great plants, are at your service.

UNITED ENGINEERING AND FOUNDRY COMPANY

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Plants at Pittsburgh • Vandergrift • New Castle
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Subsidiaries Adamson United Company, Akron, Ohio
Lobdell United Company, Wilmington, Delaware
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Oronite POLYBUTENES
economical extenders of rubber

Oronite Polybutenes are clear, light colored, chemically stable liquids of moderate to high viscosity and tackiness. They have excellent aging characteristics. They do not become gummy or waxy, do not harden, darken or change in any essential property over long periods of atmospheric exposure. They can be readily emulsified using standard techniques and equipment.

Polybutenes can be used as a rubber extender in the manufacture of a wide variety of molded rubber products such as rubber boots, garden hose, hot water bottles. Besides extending rubber, Polybutenes plasticize the mass of rubber making it more pliable for easy milling.

Oronite Polybutenes are used in milling reclaimed rubber batches and have a field of usefulness in plasticizing various synthetic rubbers.

Oronite Polybutenes are available in four grades, based on viscosity. Complete information is available in a technical bulletin.

Write or phone the Oronite office nearest you and talk over your problem with us.

ORONITE CHEMICAL COMPANY

38 SANSOME STREET, SAN FRANCISCO 4, CALIFORNIA
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK
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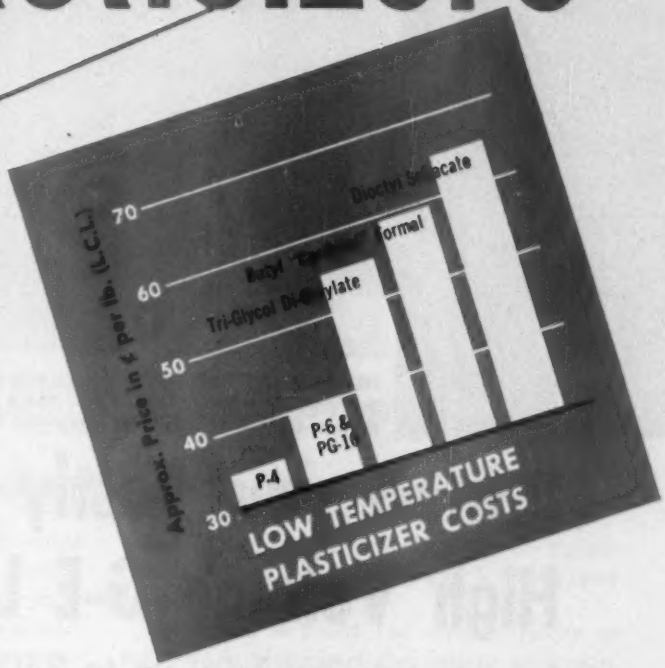
600 S. MICHIGAN AVENUE, CHICAGO 5, ILLINOIS
MERCANTILE SECURITIES BUILDING, DALLAS 1, TEXAS

ORONITE CHEMICAL COMPANY
THE NAME TO WATCH IN CHEMICALS

HOW TO CUT COSTS ON LOW TEMPERATURE LOW VOLUME SWELL

SYNTHETIC RUBBER Plasticizers

FLEXRICIN® plasticizers are fully equivalent and, in many cases, superior to the commonly used low temperature plasticizers. Added features are their extremely low volume swell in aromatic fuels and excellent recovery on low temperature compression set. Their cost is much lower. Check this graphic comparison and you will see that costs can be cut substantially.



Flexricin Rubber Plasticizers:

PG-16, Butyl Acetyl Polyricinoleate	25% Nitrile Rubber
FLEXRICIN P-4, Methyl Acetyl Ricinoleate	40% Nitrile Rubber
FLEXRICIN P-6, Butyl Acetyl Ricinoleate	Neoprene GN
FLEXRICIN P-4, Methyl Acetyl Ricinoleate	GRS

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Please send samples of the Ricinoleate Esters checked or Technical Bulletin.

☐ PG-16 ☐ P-4 ☐ P-6

☐ Technical Data

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RA-93

HERE'S WHAT CAN HAPPEN when you overload your control equipment beyond its maximum interrupting capacity. Luckily this was a test under regulated conditions . . . but this (inset) is what could happen to your equipment with inadequate interrupting capacity in your control.

Protect your costly equipment with High Voltage G-E Limitamp Control

interrupting capacity up to 250,000 kva

Don't take chances on inadequate interrupting capacity. Be sure you have the right controls to protect your equipment and personnel against the possibility of sudden and destructive electrical overloads.

For complete protection against short-circuit conditions up to 250,000 kva specify G-E Limitamp Control, a high voltage motor starter (to 4800 volts) for motors up to 2250 hp.

G-E Limitamp is easy to maintain, simple to operate. Parts can be inspected at a glance . . . fuses are easily accessible in a protected compartment . . . push-button operation permits manual starting and stopping . . . equipment stands up for years under tough conditions.

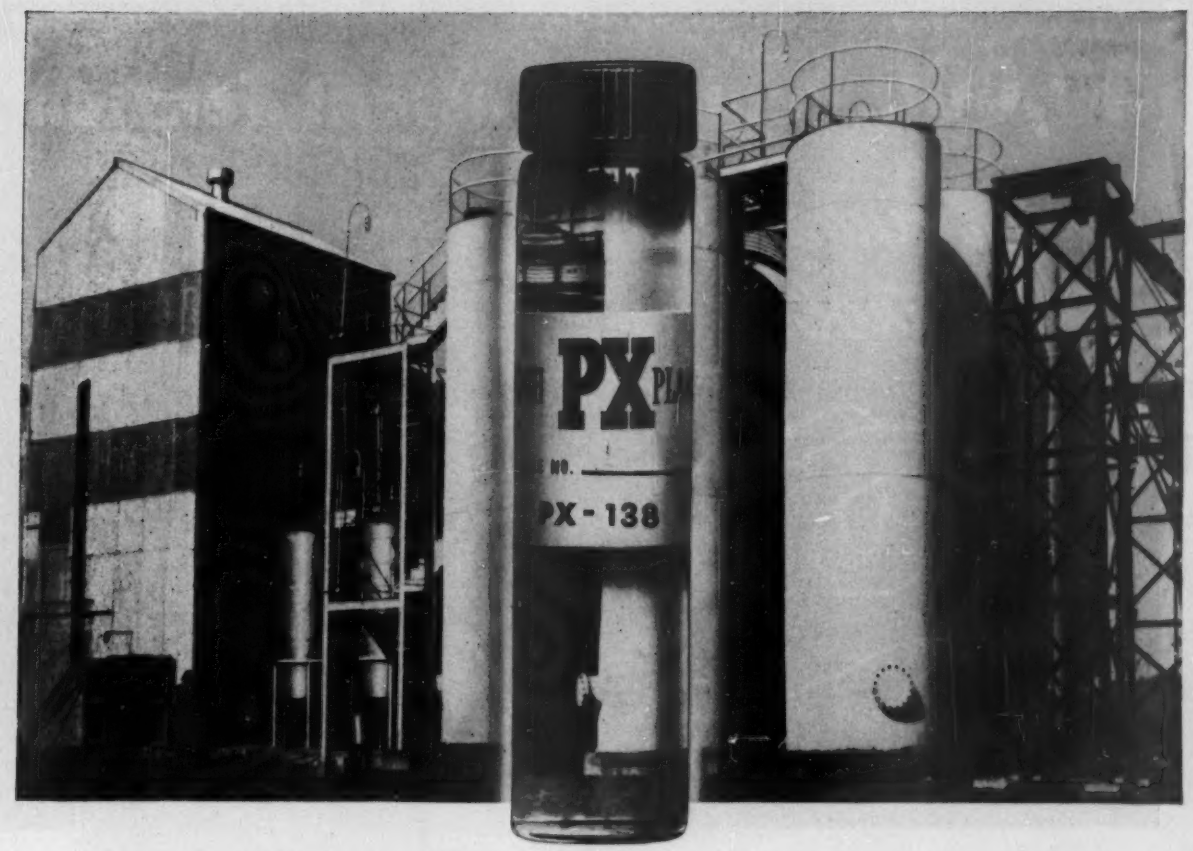
G-E engineers study your requirements . . . design all components into a co-ordinated "package" that will give you adequate interrupting capacity for your system.

For complete information contact your nearest G-E representative or write for Bulletin GEA-5409A, General Electric Company, Section 781-4, Schenectady 5, New York.

G-E Limitamp Control

You can put your confidence in—

GENERAL ELECTRIC



Behind every WATER-WHITE PITTSBURGH PX PLASTICIZER

—a basic and integrated production plant!

WHEN it comes to turning out *water-white* plasticizers, we think our new Neville Island plant—with its battery of stainless steel reaction vessels and precision control equipment—is second to none. But maintaining this recognized sign of plasticizer purity really goes back to the very moment we begin processing coal at our integrated plant. From our coke ovens, through our basic coal chemical and phthalic anhydride plant, to drumming off, we rigidly control the quality of Pittsburgh PX Plasticizers every step of the way.

The result? A broad and versatile family of water-white plasticizers that deliver peak performance and improved characteristics in your finished products every time. The proof? Send for Pittsburgh PX Plasticizer samples and specifications . . . *today!*

PITTSBURGH PX PLASTICIZERS

PX-104 DiButyl Phthalate
PX-108 DiIsoOctyl Phthalate
PX-109 DiNonyl Phthalate
PX-138 DiOctyl Phthalate
PX-158 DiCapryl Phthalate
PX-208 DiIsoOctyl Adipate
PX-209 DiNonyl Adipate
PX-238 DiOctyl Adipate
PX-404 DiButyl Sebacate
PX-408 DiIsoOctyl Sebacate
PX-438 DiOctyl Sebacate
PX-658 TetraHydroFurfuryl Oleate
PX-917 TriCresyl Phosphate

WWD 4583

PITTSBURGH
COKE & CHEMICAL CO.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

10,000 Pounds Constant Tension

under fingertip control...

... in this

IOI Nylon Tire Fabric Latexer

Complete one-man process control is but one of the many outstanding advanced-design features of this IOI latexing machine. Here are just a few of the others:

- **Simultaneous impregnation, drying and attenuation of the cords, resulting in pre-stretched tire fabric that requires no further processing prior to calendering.**
- **Direct gas-fired heating, under complete control, provides the correct high temperature required for the most efficient rate of drying either woven or weftless fabric.**
- **Rugged in construction, yet extremely flexible in operation, with constant-tension control at all speeds.**
- **Units available in various capacities, from small production machines up to high speed calender train installations.**
- **These machines require very little cleaning and a minimum of housekeeping maintenance.**

An Industrial Ovens engineer will be glad to call at your convenience to discuss the application of this machine to your particular latexing requirements.

INDUSTRIAL OVENS, INC.

13825 TRISKETT ROAD CLEVELAND 11, OHIO

You're in for A BIG SURPRISE

WHEN YOU TRY

GLYCERIZED LUBRICANT

(LIQUID CONCENTRATE)

THE ALL PURPOSE RUBBER LUBRICANT FOR

NATURAL SYNTHETIC AND RECLAIM STOCKS

Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks.

Economical?

HIGHLY CONCENTRATED
1 drum makes up to 50 drums of working solution.

YES — HERE'S WHY

Also Mfgrs. of

RUBBEROL AND **SYNTHOL** TWO OTHER FACTORY PROVED RUBBER PROCESSING AGENTS

QUALITY SINCE 1884

GENSEKE BROTHERS

RUBBER MATERIALS DIVISION

West 48th Place and Whipple Street Chicago 32, U.S.A.

Need more protection?

STABILITE*

THE ANTIOXIDANT WITH UNIQUE CHARACTERISTICS

When looking for the most economical and outstanding antioxidant for both natural and synthetic rubber, consider STABILITE, which has, combined in one material, the following characteristics:

1. *Protection against oxidation and heat, sunchecking and mechanical flexing.*
2. *Distinct softening effect on uncured rubber or GR-S, resulting in better processing and dispersion, smoother calendering and tubing and at the same time without effect on modulus at cure.*
3. *The unique property of increasing the effect of most commercial antioxidants when used in conjunction with* STABILITE. *The effect of such mixtures is greater than the components.*

For the protection of your rubber products use STABILITE; for maximum resistance to oxidation, heat, sunchecking and mechanical flexing replace part of your present antioxidant with STABILITE.

*MANUFACTURED BY CHEMICO, INC.
THE C. P. HALL CO. *Manufacturing Agents*

The C. P. Hall Co.
CHEMICAL MANUFACTURERS

AKRON, OHIO • LOS ANGELES, CALIFORNIA • CHICAGO, ILLINOIS • NEWARK, N. J.

EVERY NRM MACHINE IS CUSTOM ENGINEERED TO FIT *NATURALLY* INTO A PRODUCTION LINE

It is not by chance that most manufacturers of rubber goods use NRM equipment . . . They know that *every* NRM machine is *custom* engineered to coordinate its work perfectly with the production equipment existing in the customer's plant.

NRM Tire Building Machines, for example, have "turn-up tools" that are *custom*-built to handle the customer's particular tire construction, and "sequence control cams" designed to give the proper sequence of building operations. Standard NRM Extruders have "feed boxes" and "feed screws," which are *custom*-built to key the machine *exactly* into a particular production setup. And standard NRM Bias Cutters do *custom* work, as a result of custom-built "control heads."

From experience, the rubber industry knows that NRM's quarter-century of *creative engineering* has produced rubber processing machinery of most practical and workable *basic* design. It knows, too, that NRM engineers—who are as familiar with rubber production requirements as they are with the machines themselves — give each NRM Machine the *custom* engineering that makes it slip naturally into a rubber production setup, and helps increase production "flow" in that plant.

2106

NATIONAL RUBBER MACHINERY COMPANY

NRM Our 25th ANNIVERSARY 1928-1953

Creative Engineering

General Offices & Engineering Laboratories: Akron 8, Ohio
East: 384 Getty Ave., Clifton, N. J.
West: S. M. Kipp, Box 441, Pasadena 18, Cal.
Export: Gillespie & Company, 96 Wall St., New York 5, N. Y.

A supplement to THE ACTIVATOR—the house organ issued by The New Jersey Zinc Company for over 15 years to aid the Rubber Industry in its use of Zinc Oxide.

PROPIONATE COATING ADDS NOVEL FEATURES TO ZINC OXIDE

Rubber compounders and production men alike, in recent years, have helped to write a new chapter in the book of zinc oxide knowledge. For they have found, as they increased their use of zinc propionate coated zinc oxide, that this pigment—Protox-166*—has some advantages not available in untreated oxide.

Several of those features of Protox-166 have been described in detail in previous issues of ACTIVATOR NEWS, and others will appear here later. For your convenience, the list of such properties is shown in the attached table. If you have not yet evaluated Protox-166 in your compounds, we shall be glad to send you samples.

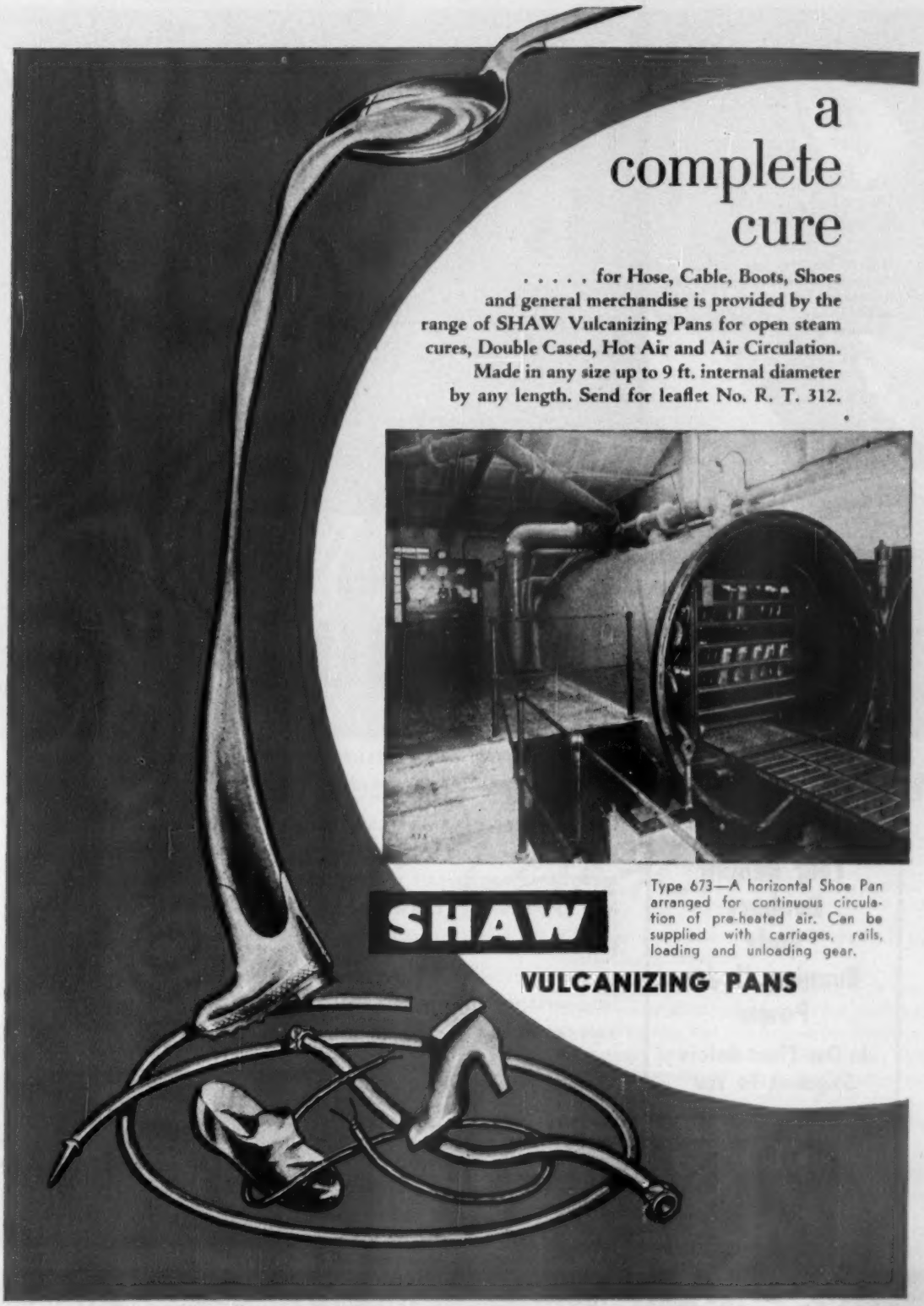
PROTOX-166 GIVES YOU ALL THESE ADVANTAGES

(COMPARED WITH ZINC OXIDES NOT OF THE PROTOX TYPE)

FEATURES OF PROTOX-166	HOW YOU PROFIT
LOWER DRY BULKING	LESS STORAGE SPACE LARGER BATCHES MORE OUTPUT
LOWER MOISTURE PICKUP	FASTER MIXING
ORGANOPHILIC COATING	QUICKER INCORPORATION BETTER DISPERSION LOWER POWER CONSUMPTION EVEN ACTIVATING AMOUNTS SPEED MIXING OF CARBON BLACKS
SCORCH INHIBITION	MORE PRODUCTION
PLASTICIZING EFFECT	FASTER, SMOOTHER TUBING AND CALENDERING REDUCES DIE SWELL CUTS CALENDER SHRINKAGE GIVES COOLER-RUNNING STOCKS
HIGHER REINFORCEMENT	IMPROVED TENSILES BETTER TEAR RESISTANCE HIGHER MODULUS GREATER RESILIENCE
MINIMUM PROGRESSIVE CURE, EVEN WITH PERSISTENT ACCELERATORS	LONGER SERVICE LIFE

*U. S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY
Producers of Horse Head Zinc Pigments
... most used by rubber manufacturers since 1852
160 Front Street, New York 38, N. Y.
HORSE HEAD PRODUCTS



a complete cure

. . . . . for Hose, Cable, Boots, Shoes and general merchandise is provided by the range of SHAW Vulcanizing Pans for open steam cures, Double Cased, Hot Air and Air Circulation. Made in any size up to 9 ft. internal diameter by any length. Send for leaflet No. R. T. 312.

Type 673—A horizontal Shoe Pan arranged for continuous circulation of pre-heated air. Can be supplied with carriages, rails, loading and unloading gear.

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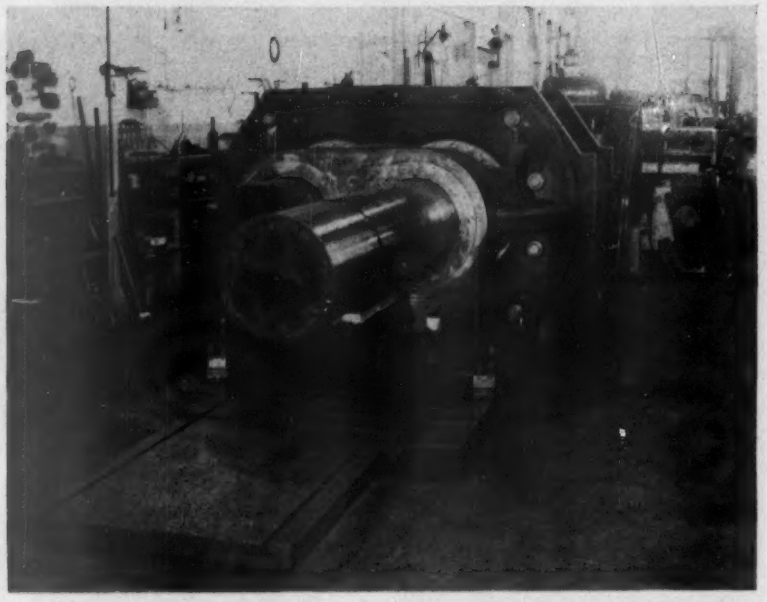
Enquiries to Francis Shaw (Canada) Limited, Grahams Lane, Burlington, Ontario, CANADA



No. 27 Banbury body rebuilt by Interstate, reassembled and mounted on bed plate in our plant ready for customer to see it running.

Why It Pays To Have Your Worn

BANBURY REBUILT *Here*

We Invite You To See Your Rebuilt Banbury Body Running Under Power In Our Plant Before Shipment To You

BECAUSE, now, added service features assure still greater all-way savings for you.

Our production facilities have been greatly expanded, and further perfected. Now, more than ever, an Interstate Banbury rebuilding means every worn part restored to correct dimensions and contour, and "good-as-new" efficiency.

If you have a Banbury that needs attention give us a call. A worn mixer is a liability. We can give you quick service on rebuilding and hard-surfacing any size, and we can fabricate any of the parts needed. Full details and an estimate are yours for the asking.

Our own plane is ready to fly a Banbury expert to your plant for consultation on any Banbury problem you may have.

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EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING

INTERSTATE WELDING SERVICE

Main Offices – Metropolitan Bldg., AKRON 8, OHIO Phone JE-7970

When oil resistance is a *must* ... it's *Paracril!*

Nothing demands oil resistance like the actual equipment used in drilling for oil.

That's why you'll find Paracril® chemical rubber as the packing element in these reliable heavy-duty packers that work right in the oil well shaft.

The thick-walled Paracril gasket readily packs off with but small longitudinal compression. Yet it withstands pressure as high as 6000 lbs.—at temperatures up to 300°F.—with absolutely no leakage or failure!

Little wonder more and more of those who know oil are getting to know and specify Paracril for outstanding oil resistance.

This unique chemical rubber is available in three general grades of oil resistance to meet practically any requirements. And with its great flexibility, tensile strength, and resistance to abrasion and high and low temperatures, it may be used to advantage wherever a rubberlike material is needed. Paracril may also be blended with other rubbers or plastic resins to impart special desirable properties.

If you're not already familiar with the many benefits Paracril offers you, simply write on your letterhead to the address below.

Note: Naugatuck Chemical makes and supplies Paracril only, not the oil well packer shown. This is produced by Oil Center Tool Co., Houston, Texas.

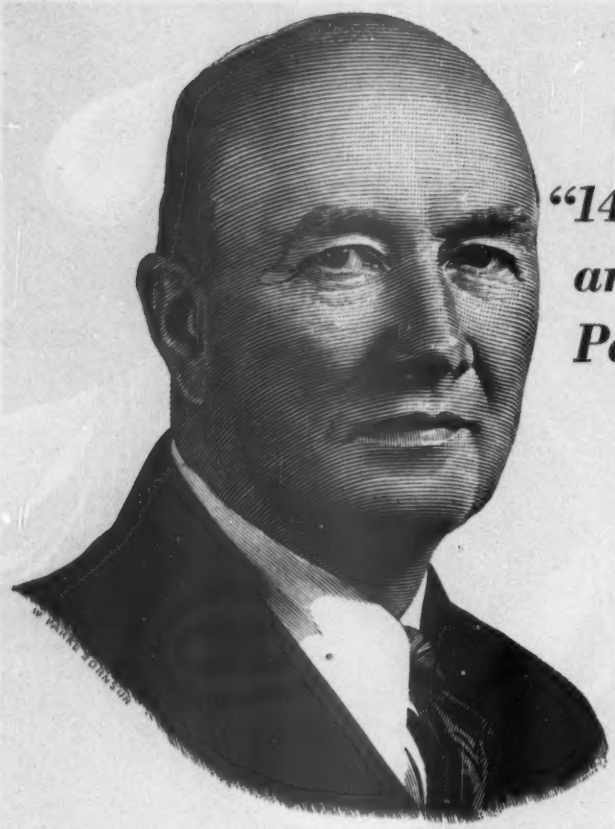
Naugatuck Chemical

Division of United States Rubber Company

109 ELM STREET
NAUGATUCK, CONNECTICUT

IN CANADA: NAUGATUCK CHEMICALS DIVISION • Dominion Rubber Company, Limited, Elmira, Ontario

Rubber Chemicals • Aromatics • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices



"144,000 of our employees are enrolled in the Payroll Savings Plan"

C. F. HOOD
President, United States Steel Corporation

"The response of our employees to the Payroll Savings Plan for U. S. Savings Bonds is dramatic evidence of their conviction that Freedom is Everybody's Job. We are proud of their outstanding record in saving systematically in "E" Bonds, in thus adding to their financial independence as they give effective support to the nation."

Mr. Hood and his associates may well be proud of the Steel Corporation's Payroll Savings figures:

- 144,000 men and women of U. S. Steel are enrolled in the Payroll Savings Plan—an over-all employee participation of 52%—excellent for a company as large as U. S. Steel.
- the average monthly investment of a U. S. Steel Payroll Saver is $20.79.
- every month, these 144,000 employees invest $2,993,760 in personal security—and America's economic stability.
- in some U. S. Steel plants and subsidiaries employee participation runs as high as 80%.

Nearly eight million men and women, in forty-five thousand companies, large and small, are building personal security and contributing to national economic stability by their $160,000,000 monthly investment in U. S. Savings Bonds. These Payroll Savers, with their $25 and $50 Bonds, are major shareholders in a huge reservoir of future purchasing power—the $35.5 billion, *cash value* of Series E Bonds outstanding.

What is the employee participation in *your* Payroll Savings Plan? The average monthly deduction? How many employees have been *added* to your Payroll Savings Plan in the last year? Call for the figures and study them. Then, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Washington Building, Washington, D. C. Your State Director will be glad to show you how easy it is to raise employee participation in your plan to 60%, 70%, or even better.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

RUBBER AGE

the NATCHEZ TRACE

Buffalo journeying to the salt licks in Tennessee first broke the trail; then came the Indian. DeSoto traveled it, hoping to find gold. In the late 1700's the Natchez Trace became the overland link between the Spanish-controlled lower Mississippi valley, whose northernmost point was Natchez, and the nearest American village, Nashville. Boatmen who had floated down the river returned on foot via the Trace, since walking was easier than poling a boat upstream. Hundreds of settlers from Kentucky, Tennessee, Ohio, and Virginia went westward over the trail, particularly into Texas. In the 1860's, soldiers of both North and South traversed the Trace. Oddly, with all of its use through the decades, it never became a good wagon road. Its end came with the invention of the steamboat.

Natchez and Nashville and all their contiguous areas are, for all practical purposes, neighbors today. Good highways link them together and travel is but a matter of hours. On these highways, as on all others where man ventures, the rubber tire transports the products of his toil and invention. Carbon black is a vital component of the rubber tire to which it imparts long life and durability.

UNITED CARBON COMPANY, INC.

Kosmos 40, a high modulus gas base furnace black (HMF), has a long-established record for uniformity, easy mixing, good tubing, freedom from scorch, and a balanced reinforcement that assures high resiliency, low hysteresis, and good resistance to tear and flex.

For quieter-riding tire treads use some Kosmos 40 — plus, of course, United's high reinforcing blacks.

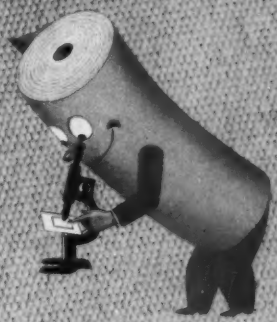
UNITED CARBON COMPANY, INC.

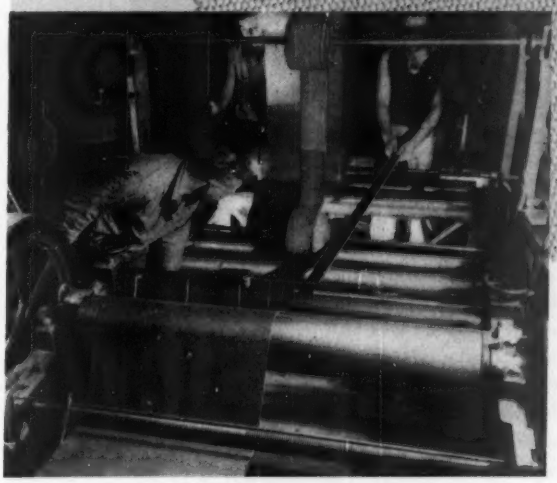
CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO BOSTON MEMPHIS

UNIFORMITY
Makes The Big Difference
In INDUSTRIAL FABRICS

MT. VERNON FABRICS
Give You Greater Fabric Uniformity





Checking evenness of roving with Belger Tester.

One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

Mt. Vernon-Woodberry Mills

Branch Offices: Chicago • Atlanta
Baltimore • Boston • Los Angeles

TURNER HALSEY COMPANY
Selling Agents
40 WORTH ST NEW YORK

FABRICS ENGINEERED TO FIT YOUR NEEDS

Need adaptation of an existing fabric to your special purposes? Or creation of an entirely NEW fabric — cotton, synthetic or blend — to meet your specifications? Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

DOW CORNING Release Agents give the finish that sells floor tile

It's appearance—not mileage—that sells floor tile!

The rich, deep colors and the delicate tints architects and decorators call for must come clean from the molds with a surface that looks polished and free from any bloom or blemish.

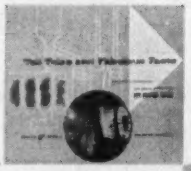
And that's why most of the leading producers of rubber floor tile use Dow Corning silicone release agents. They keep highly polished press plates clean and smooth; improve the flow of heavily loaded stocks. They never break down to form a carbonaceous deposit that roughens the surface or discolors even the lightest tile.

Easily diluted with water, Dow Corning Emulsions cut mold maintenance costs to the vanishing point; reduce scrap by as much as 80%. And that's why Dow Corning silicone mold lubricants are the most widely used release agents in the rubber industry. Use silicone fluids for green carcass, bead and parting line release; the emulsions for all kinds of molds, mandrels and butyl curing bags.

For more sales appeal at lower costs specify DOW CORNING SILICONE RELEASE AGENTS

You can also make profitable use of many other Dow Corning silicone products.

WRITE TODAY **for your free copy of our NEW, 24 page TENTH ANNIVERSARY booklet, TALL TALES and FABULOUS FACTS.**



DOW CORNING CORPORATION, Dept. CM-9, Midland, Michigan

Please send me a free copy of Tall Tales and Fabulous Facts

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

DOW CORNING SILICONES

DOW CORNING CORPORATION

MIDLAND, MICHIGAN

ATLANTA • CHICAGO • CLEVELAND • DALLAS • DETROIT
LOS ANGELES • NEW YORK • WASHINGTON, D. C. (Silver Spring, Md.)

IN CANADA: Fiberglas Canada Ltd., Toronto, Ontario
IN GREAT BRITAIN: Midland Silicones, Ltd., London, W. 1

NEVILLE – the Name to Remember in RUBBER PROCESSING

Resins and Oils

WHITE WALL TIRE STOCKS

TIRES & TUBES

RUBBER MATS

MECHANICAL GOODS

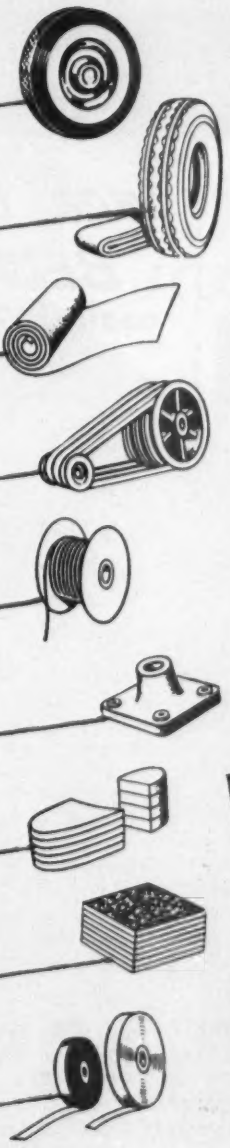
WIRE INSULATION

MOLDED PRODUCTS

RUBBER SOLES & HEELS

RUBBER FLOOR TILE

ADHESIVE TAPE



You will find Neville Coumarone Resins ideal extender-plasticizers, which will not tend to lower hardness, tensile, modulus or tear. They are available in various grades of melting points and colors.

Neville Resins and Oils are products of years of experience in meeting rubber processing problems. They save production time and costs, to say nothing of improving product quality.

Let us help you select the right grade for your purpose.

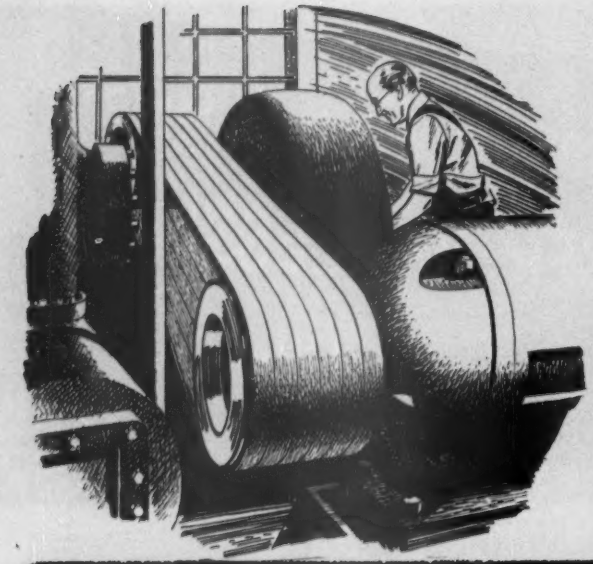
THE NEVILLE COMPANY

PITTSBURGH 25, PA.

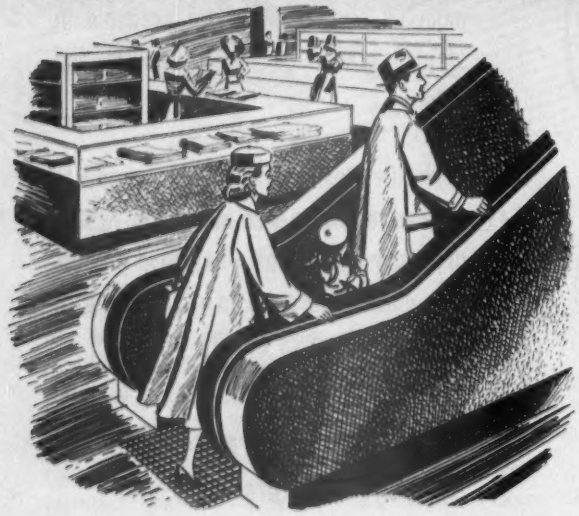
Plants at Neville Island, Pa., and Anaheim, Cal.

Chemicals for the Rubber Industry

R 51



If it's got to be a real ALL-AROUND PERFORMER..



make it "SHAWMUT BELTING DUCK"

another Wellington Sears fabric for the rubber industry

Year after year Shawmut Belting Duck continues to supply the answer to a variety of rubber-and-fabric problems. It's specified wherever great longitudinal strength, good adhesion and bulking properties and economical cost are needed.

This sturdy, pliable belting owes its strength to the precisely controlled construction and twist of the rugged plied yarns in the warp and filling. It's produced by a mill that has specialized in heavy-duty fabrics for more than 100 years.

Shawmut Belting Duck is just one of many famous Wellington Sears cotton ducks for belting and other mechan'cal rubber products. The use of Superior Army Duck as a cover fabric for V-belts is another example.

Wellington Sears has the answer, too, for special problems, such as the need for exceptional troughing qualities in conveyor belts, or power transmission belts combining unusual strength with minimum weight and bulk. We have developed fabrics to utilize the unique properties of nylon, high-tenacity rayon and other fibers.

Typical fabrics for the rubber industry are at the right. A call or letter to your nearest Wellington Sears office will place full information at your disposal. Let's talk it over.

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and two-ply chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high-tenacity rayon, other synthetics and blends.

Wellington Sears

A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK 13, N. Y.

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ACCURACY

Temperature and power consumption are automatically controlled and recorded during laboratory compounding operations to provide an accurate analysis of the processing characteristics of Pelletex SRF rubber compounded stocks. Cabot Compounding Laboratories are equipped with Banbury mixers, laboratory roll mills and curing presses. In addition, plastometers, extruders and the Mooney viscometer provide precise evaluation of compounded stocks.

A Cabot compounder is shown operating the Banbury mixer.

GENERAL ATLAS DIVISION
of Cabot Carbon Company

GODFREY L. CABOT, INC.
77 Franklin Street, Boston 10, Mass.

CABOT

PELLETEX

ST. JOE Unit-Loads

FOR TRUCK & CARLOAD SHIPMENTS OF

ZINC OXIDE

NOW AVAILABLE AT NO ADDITIONAL COST

THE ST. JOSEPH LEAD COMPANY after several years of experimenting, has developed for its zinc oxide customers a loading method known to the trade as "unit load." This new method has been worked out successfully for both truck and carload shipments with a number of zinc oxide users who have adopted it as a standard practice for their shipments. This service is provided at no additional cost to the customer, and has resulted in a saving of up to 50% of the unloading cost of bag by bag handling. Each unit-load is compressed to about 75% of its original volume, which results in increased storage capacity. Improved material handling, and greater cleanliness are other advantages gained by this method.

OUR 6-PAGE ILLUSTRATED FOLDER, CONTAINING DETAILED OPERATING DATA ON THE ST. JOE UNIT-LOAD METHOD IS YOURS FOR THE ASKING.

ST. JOSEPH LEAD COMPANY
250 Park Avenue, New York 17

Plant & Laboratory:
Monaca (Josephtown) Pennsylvania

Insure the good reputation of *your* products!!

• Be safe • be sure • be satisfied
SPECIFY EMERY FATTY ACIDS *everytime!*

Good news about Plasticizers!

Plastolein Plasticizers will soon be available in increased quantities at lower prices. Now's the time to investigate these important plasticizers in vinyls, cellulosics and synthetic rubbers:

Plastolein 9050 DHZ
(di-2-ethylbutyl azelate)
Plastolein 9057 DIOZ
(di-iso-octyl azelate)
Plastolein 9058 DOZ
(di-2-ethylhexyl azelate)
Plastolein 9055 DGP
(diethylene glycol dipelargonate)
Plastolein 9250 THFO
(tetrahydrofurfuryl oleate)
Plastolein 9715 Polymeric
Plastolein 9720 Polymeric

In selecting the constituents that go into your products, you can't be too careful in getting the highest quality available, consistent with performance requirements and cost limitations.

When it comes to fatty acids, this careful selection always leads to Emery...because Emery Fatty Acids are safeguarded by modern processing methods and strict control of specifications, compositions and stability.

These advanced processing and control methods have been an outgrowth of Emery's pioneering in better and unique processes and products exemplified by the following innovations.

Emersol Solvent Crystallization Process
Lowest I.V. Crystalline Stearic Acid
Low-Titer Semi-Drying Fatty Acids
Ozone-Oxidation of Oleic Acids
Colgate-Emery Fat Splitting
High Pressure Dimerization
Low Linoleic Oleic Acid
Azelaic and Pelargonic Acids

So, when you need fatty acids, select the best...select from Emery's complete line of Emersol Stearic and Palmitic Acids, Hyfac Hydrogenated Fatty Acids, Emersol Oleic Acids, Vegetable and Animal Fatty Acids, and Special Fatty Acids and Derivatives.

Send for free literature . . .

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Plastolein Plasticizers
Twitchell Oils, Emulsifiers

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Emery Industries, Inc.
Dept. U-9, Carew Tower, Cincinnati 2, Ohio

☐ Plasticizers
☐ Solid Fatty Acids
☐ Rapid Composition Analysis for Commercial Stearic Acids

Name.....*Title*.....
Company.....
Address.....
City.....*Zone*.....*State*.....

From these Z rolls come
THE MOST ACCURATELY CALENDERED PRODUCTS
of rubber and plastics ever produced

Nearly eight years ago Farrel-Birmingham announced the development of its four-roll "Z" calender as *"the most significant advance in calender design since this company first built calenders for the rubber industry in 1854."*

If anyone accepted this statement with reservations at the time, his doubts have long since been dispelled. The remarkable performance of these machines has established new standards for accuracy in calendering both rubber and plastics.

Farrel-Birmingham has made practically all of the "Z" calenders in operation today. Built in a range of sizes up to 36″ x 92″, these machines are located in plants of major rubber and plastics manufacturers in the United States, Canada, Mexico, and England.

With each installation of the "Z" calender, Farrel-Birmingham engineers have given on-location assistance to assure the most satisfactory performance. The result has been that with this machine a control of production has been obtained, which is more exact than was ever thought possible in the art of calendering.

Farrel-Birmingham's experience with "Z" calenders for numerous applications has been so thorough that, today, calculated risk on the part of the customer is entirely eliminated.

Farrel-Birmingham "Z" calenders are used for calendering both rubber and plastics products. They have proved equally outstanding in the production of film and sheeting and for coating. These machines can be furnished with embossing unit integral with, or separate from, the calender, and with cooling train and windup.

Farrel-Birmingham also manufactures Banbury mixers, extruding machines and mills to complete the equipment assembly of an entire production unit.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

FB-853

Farrel-Birmingham®

DESIGN FEATURES OF THE "Z" CALENDER

1. The "Z" arrangement of the four rolls isolates the separating forces. With only two rolls in any plane, there is no pressure from a third roll to affect roll settings and cause fluctuations in gauge.
2. Motorized crossed axes device (single or double) provides fine "crown" adjustment.
3. Hydraulic preloading devices anchor the rolls in their fixed loaded positions in precision bearings.
4. Rolls are drilled longitudinally under the working surface for most effective temperature control.
5. Uni-drive eliminates drive and connecting gears from the calender itself. The gears are enclosed in a separate housing and are coupled to the rolls with universal spindles.

OSBORN

This wheel of fortune pays 20 to 1 on every turn

In one minute this machine does a job that formerly required 30 minutes! It shows what *you* can do with new OSBORN Power Brushing techniques to speed *your* production and cut costs.

The job consists of deburring ends of stainless steel blades of a jet engine stator assembly. Chucked up in a grinder, as shown, the assembly rotates counter-clockwise at 20 rpm. An 8-inch grinding wheel grinds the ends of the vanes. Burrs and feather edges are then removed by two OSBORN 10-inch Monitor® Brushes rotating at 2800 rpm—45 seconds in each direction. The complete cycle takes 1½ minutes. Vane ends are made uniformly smooth, 20 times as fast as former hand method.

The answer to *your* production problems may be found with special Osborn-equipped machines such as this . . . or with one of the Osborn Brushing Machines which are being used in scores of plants for high-speed deburring. For *any* problem in deburring, cleaning and finishing, start tackling it with the powerful experience of your **O**sborn **B**rushing **A**nalyst. Call him or write *The Osborn Manufacturing Company, Dept. BB-3, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

FREE: New booklet on deburring with Osborn Power Brushing. Write for your copy.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

RELIABLE ZINC OXIDES

AZO-ZZZ-44 and AZO-ZZZ-55 assure good dispersion and easy processing because of their uniform particle size and absence of extreme fines. With AZO-ZZZ-11, 22, 33, (Acicular types) and special grades, a complete range of zinc oxides is offered for every rubber requirement.

A RELIABLE SOURCE

American Zinc assures an uninterrupted supply of zinc oxide. Recent discovery and development of a new, large ore body, added to previous American Zinc reserves, provides sufficient ore to last many years at the current rate of production.

ZZZ-44

ZZZ-55

AMERICAN ZINC SALES COMPANY

distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

WIRE BRAID
helps put the *punch* in
UNCLE SAM'S AIR ARM!

HERE'S the plant that powers new super jets—one of the most powerful jet engines ever released for production!

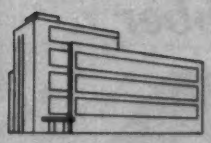
Look closely and note the broad application of tubular wire braid. It is typical of many types and sizes regularly produced by National-Standard for aircraft service—used not only for electrical shielding, but to reinforce thermocouple harness leads, as shown.

National-Standard with the largest range of wire braiding equipment in the country, is well prepared to supply or develop special braid that will meet your needs *exactly!*

NS
NATIONAL-STANDARD
Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	**Flat, High Carbon, Cold Rolled Spring Steel**
NATIONAL-STANDARD	*Niles, Mich.*	**Tire Wire, Stainless, Fabricated Braids and Tape**
REYNOLDS WIRE	*Dixon, Illinois*	**Industrial Wire Cloth**
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	**Metal Decorating Equipment**
WORCESTER WIRE WORKS	*Worcester, Mass.*	**Round and Shaped Steel Wire, Small Sizes**



On YOUR Staff

Customer service work is carried on constantly in the Compounding Laboratory (top) and Physical Testing Laboratory (bottom).

Basic research on plasticizers is one of the principal functions of the Organic Laboratory.

- **Cabflex Di-OP** *di-iso-octyl phthalate*
- **Cabflex DCP** *di-capryl phthalate*
- **Cabflex Di-OA** *di-iso-octyl adipate*
- **Cabflex DDP** *di-decyl phthalate*
- **Cabflex DDA** *di-decyl adipate*
- **Cabflex Di-BA** *di-iso-butyl adipate*
- **Cabflex Di-OZ** *di-iso-octyl azelate*
- **Cabol 100** *hydrocarbon oil plasticizer*

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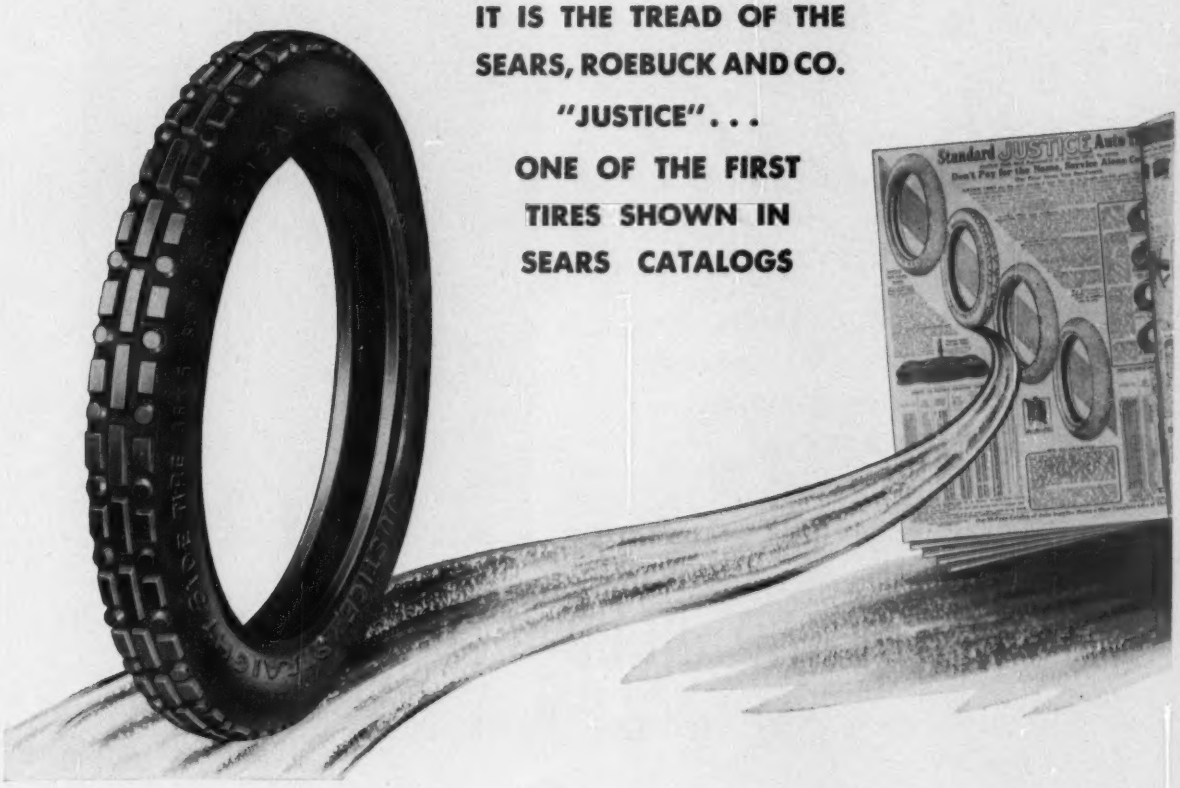

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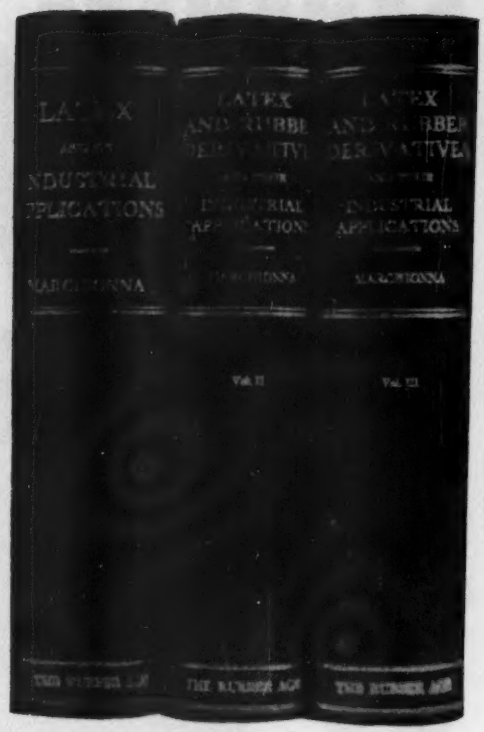

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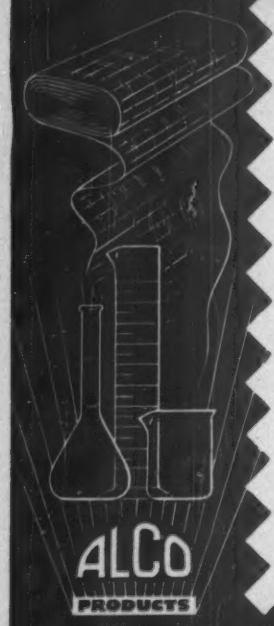

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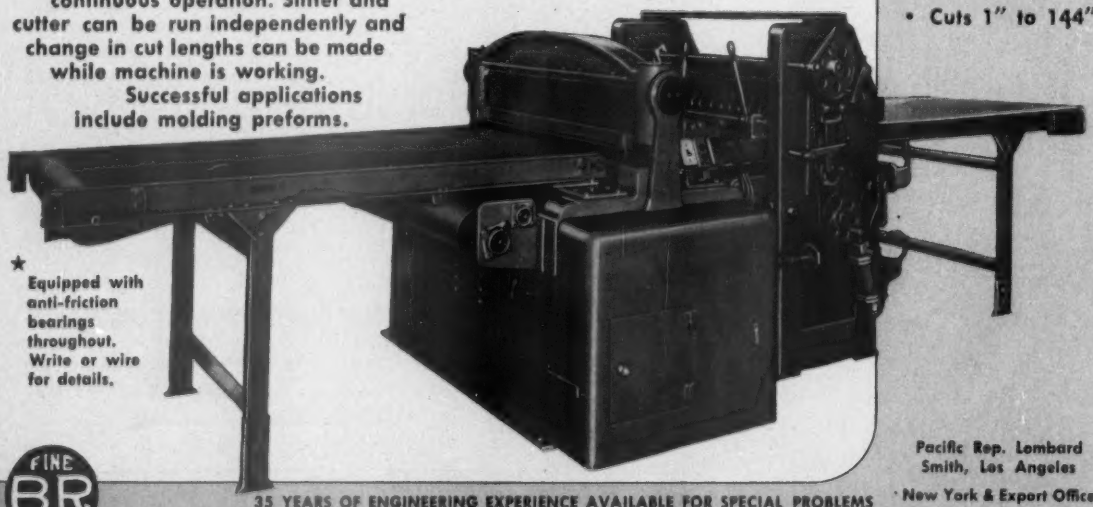

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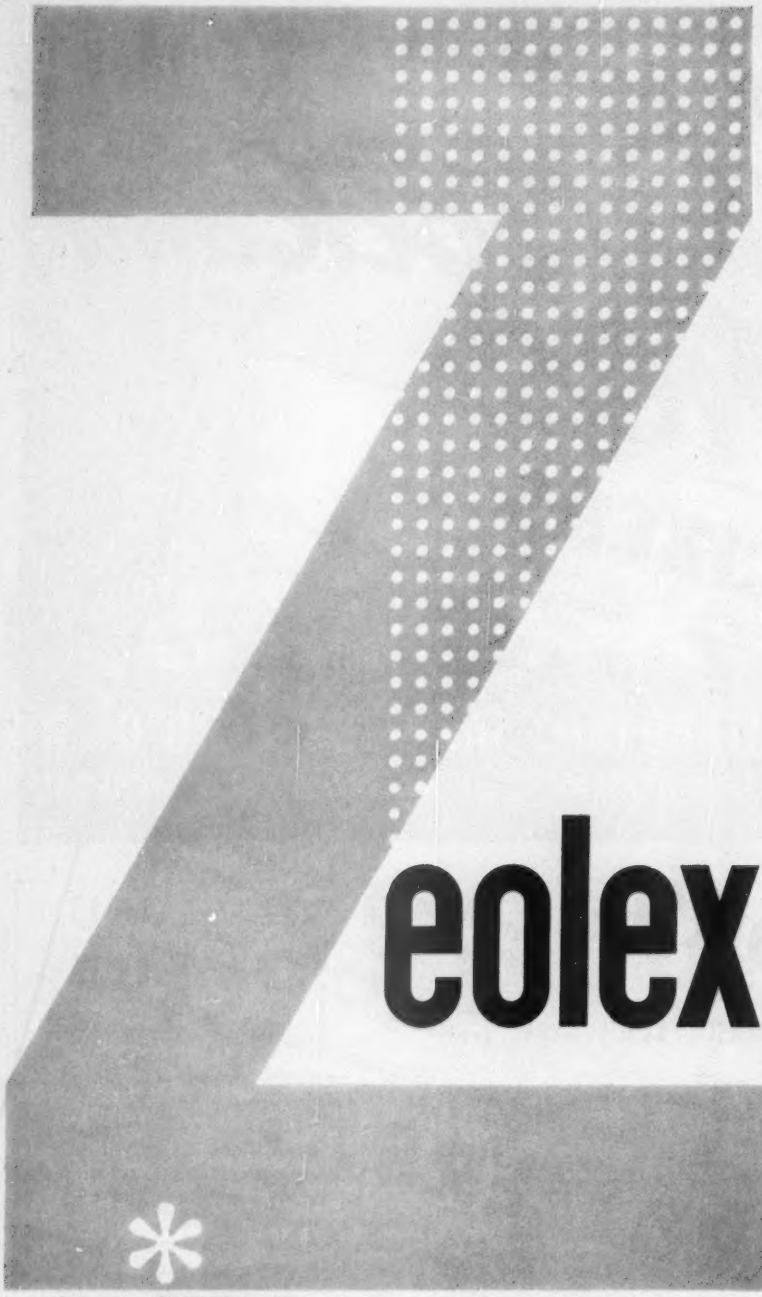

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RUBBER AGE

Vol. 73, No. 6 SEPTEMBER, 1953

Powdered Reclaim

By D. S. LE BEAU

Director of Research, Midwest Rubber Reclaiming Co., East St. Louis, Ill.

FOR a number of years reclaim has been produced in the form of slabs of varying size. These slabs were obtained by laminating the fine sheets of reclaim coming off the refiner mill. The present paper concerns itself with reclaim produced in powder form *(4)* so that it is free flowing and suitable for automatic handling and weighing. Laboratory data which have been obtained from such reclaim powders will be discussed.

A variety of these reclaim powders can be produced. They are usually, but not necessarily, prepared in premix form and will produce pliable, coherent sheets on milling equipment. The particle size of these reclaim powders can be varied considerably.

Whole tire passenger and truck tire scrap was used in the preparation of these reclaim powders. Table I shows the analysis of these scraps for their identification. Analyses were carried out both on each of the original scraps, as well as on each of these scraps after they had been subjected to the time and temperature conditions used in the preparation of the reclaim powders. This was done to see the effect of such treatment. No reclaiming oils or catalysts were added for this particular purpose.

Effect of Particle Size on Reclaiming

Inasmuch as it is well known that the particle size of scrap can exert an influence on the uniformity of the reclaim produced therefrom it was decided to study the effect of it on powdered reclaims produced therefrom. The ground scrap was subjected to a screen analysis. Several particle size distributions were used for the production of identical reclaim powders. Each of these reclaim powders contained 20% of added carbon black and analyzed to 5.2% of ash and 38% of total carbon black. (This includes the carbon black originally present in the scrap). Each of these sized reclaim powders was analyzed for acetone and uncured chloroform extracts.

Data obtained from these analyses would give an indication of the uniformity or variability of the reclaim-

Note: This paper was presented before the Division of Rubber Chemistry, A. C. S., Los Angeles, Calif., March 18-19, 1953.

TABLE I—ANALYSIS OF SCRAP USED IN PREPARATION OF RECLAIM POWDERS

	Passenger Tires		Truck Tires	
	Original	Heated to 194° C.	Original	Heated to 194° C.
% Acetone Extract..	9.5	11.5	9.6	11.6
% Uncured Chloroform Extract		5.3		4.5
% Ash	9.2	9.1	7.5	7.4
% Carbon Black.....	19.8	19.7	22.8	22.6
% Cellulose				
% RHC (By Diff.)..	58.8	57.0	57.3	55.7
% RHC (Direct) ...	38.8		34.4	

TABLE II—EFFECT OF PARTICLE SIZE ON POWDER RECLAIMING

Particle Size		% Acetone Extract	% Uncured Chloroform Extract	3 Min. Mooney Plasticity
Mesh	Particle Diameter Limits			
16–20	1190–840μ (0.0469–0.0331")	17.8%	15.8%	71/22
20–30	840–590μ (0.0331–0.0232")	17.8%	15.8%	73/23
30–40	590–420μ (0.0232–0.0165")	17.7%	14.8%	70/23
40–60	420–250μ (0.0165–0.0098")	17.9%	14.8%	67/20
>60	>250μ (0.0098")	17.8%	14.5%	80/26

ing process as a function of particle size limits. The data for the acetone extracts would show whether an increase in surface area, which would be considerable within the particle size ranges investigated, would result in increased oxidation of the rubber polymers. The data obtained for the uncured chloroform extracts would show the theoretical extent of reclamation as measured by polymer breakdown and the effect particle size might have on this reaction. The data are shown in Table II.

It will be noticed from the table that the acetone extract stayed constant regardless of the particle size, indicating that oxidation, if it occurred, did not depend on available surface area. The uncured chloroform extract, which can be considered a theoretical measure of the extent of reclaiming, stayed constant between 1190 and 590μ average apparent particle diameter. Below a particle size of 590μ it dropped slightly but again stayed constant throughout the lower particle size limits investigated.

To take the Mooney plasticities, the samples were given a 1½ minute milling and then left to recover for 10 days. Instead of a 1 minute warming up period in the Mooney plastometer, 5 minutes were used. The Mooney plasticity values of all the particle sizes, except the one below 250μ average particle diameter, were practically identical. The data presented in Table II indicate that within the limits investigated the particle size of the vulcanized scrap used in the production of the reclaim powder is not of importance for uniform reclaiming.

Properties of Reclaim Powder

To determine the effect of reclaim powder on the physical properties of carbon black compounds containing natural rubber and GR-S, five compounds were prepared in a laboratory size B Banbury. Two of these compounds were prepared from two conventional first line whole tire reclaims, the other three were prepared from three different reclaim powders, the difference being one of reclaiming oils and catalysts rather than one of composition. The reclaim powders used were in the form of premixes and were especially prepared for the purpose. They contained the exact amount of carbon black which was necessary for the compounding recipe. Table III shows the analyses of these reclaim powders and the conventional reclaims used as control.

The reclaim powders were mixed in the laboratory Banbury mixer according to the recipes shown in Table IV. The amount of fluxing oil was changed for each of the compounds in an effort to provide compounds of fairly closely related Mooney values and Shore hardness ratings. It was noticed that batch sizes of 1410 grams which were suitable for the conventional reclaims would be too small for the reclaim powders. To obtain a comparable Banbury ram working height the batch sizes for the compounds containing reclaim powders had to be increased by 8%. The amount of this increase will, of course, depend on the amount of reclaim powder called for in the compounding recipe. Mixing temperature stayed lower when the reclaim powders were used in spite of the increase in batch size. The dumping temperatures are recorded on the four accompanying power charts.

All of the reclaims and reclaim powders were given the same mixing cycle. The first pass included one-half of the natural and synthetic rubber called for in the recipe together with all of the reclaim powder, or in the case of the two controls, together with all of the reclaim

TABLE III—CHEMICAL ANALYSES OF CONVENTIONAL RECLAIMS AND RECLAIM POWDERS

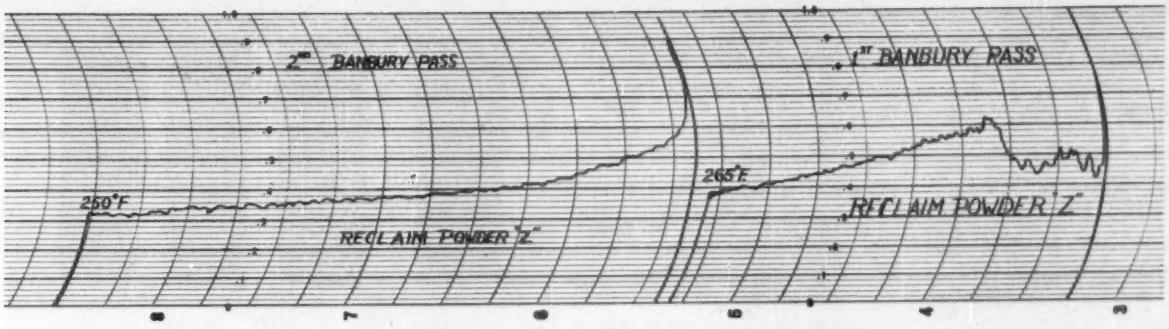
	Conventional Reclaims		Reclaim Powders		
	A	B	X	Y	Z
% Acetone Extract	17.0	20.0	14.6	18.3	16.3
% Ash	6.0	10.0	4.2	4.0	4.5
% Cellulose		1.0			
% Carbon Black	24.0	17.0	44.0*	43.9*	44.0*
% RHC (Diff.)	50.0	50.0	35.2	32.0	33.2
% RHC (Direct)	28.0	30.0	19.0	17.5	18.4

* 25% added.

TABLE IV—TEST RECIPES

	Conventional Reclaims		Reclaim Powders		
	A	B	X	Y	Z
GR-S 1000	35.0	35.0	35.0	35.0	35.0
Smoked Sheets	35.0	35.0	35.0	35.0	35.0
Reclaim A	60.0*	—	—	—	—
Reclaim B	—	60.0*	—	—	—
Reclaim Powder X	—	—	89.8*	—	—
Reclaim Powder Y	—	—	—	94.9*	—
Reclaim Powder Z	—	—	—	—	91.4*
Philblack A	25.0	25.0	—	—	—
Paraflux	5.0	10.0	1.5	1.5	1.5
Zinc oxide	5.0	5.0	5.0	5.0	5.0
Dibutyl ammonium oleate	0.6	0.6	0.6	0.6	0.6
Benzothiazyl Disulfide	0.5	0.5	0.5	0.5	0.5
Amine type accelerator (Aktone)	0.5	0.5	0.5	0.5	0.5
Reaction product of diphenylamine and acetone	1.0	1.0	1.0	1.0	1.0
Sulfur	2.6	2.6	2.6	2.6	2.6
Stearic Acid	2.0	2.0	2.0	2.0	2.0
Total	172.2	177.2	182.5	188.6	185.1
3 Min. Mooney LR	37/4	41/7	31/2	30/3	25/3

* 30 RHC.



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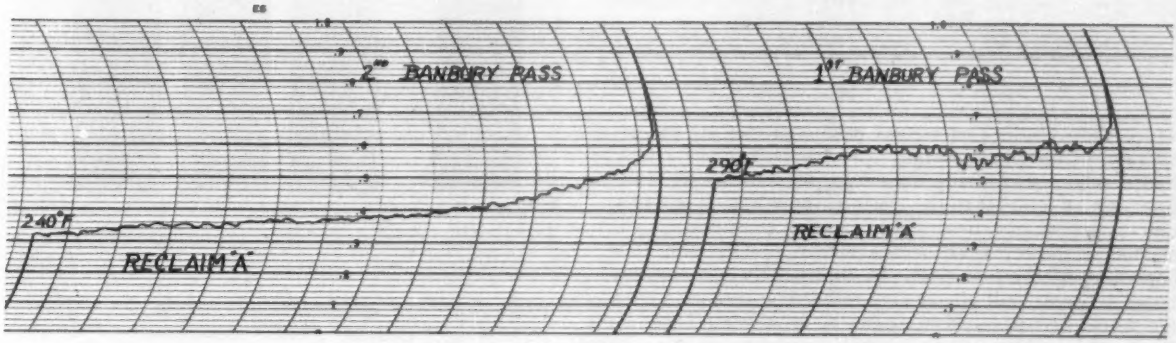

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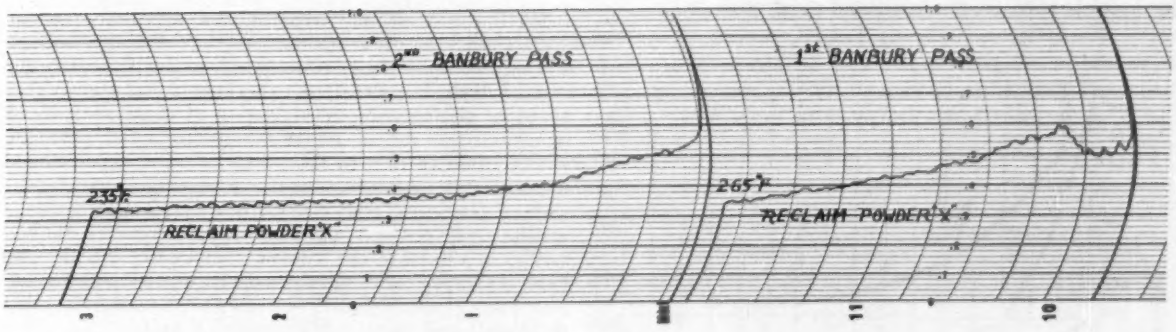

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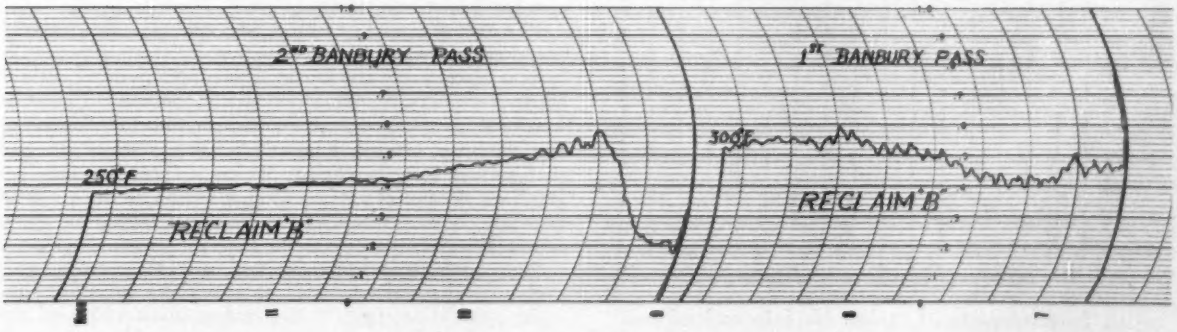

Chart No. 4

TABLE V—POWER CONSUMPTION REQUIREMENTS

	1st Banbury Pass	2nd Banbury Pass
Reclaim A.....	Average KW = 9.90	Average KW = 7.20
	$\frac{KW}{Kg}$ = 7.02	$\frac{KW}{Kg}$ = 4.77
Reclaim B.....	Average KW = 8.20	Average KW = 6.34
	$\frac{KW}{Kg}$ = 5.81	$\frac{KW}{Kg}$ = 4.20
Reclaim Powder X	Average KW = 7.62	Average KW = 6.38
	$\frac{KW}{Kg}$ = 4.98	$\frac{KW}{Kg}$ = 4.28
Reclaim Powder Z	Average KW = 7.82	Average KW = 6.20
	$\frac{KW}{Kg}$ = 5.00	$\frac{KW}{Kg}$ = 4.20

and carbon black. The second pass consisted of the remainder of the compounding materials including the new hydrocarbons and finally the curing ingredients. It is interesting to note that the reclaim powders apparently mix faster on the first pass than the conventional reclaims. A power peak occurs rather shortly after the beginning of the first pass. In contrast thereto conventional reclaims pull power at a rather constant rate over the whole first pass. Also, as can be seen from Table V, the power consumption per unit weight appears to be smaller for the reclaim powders.

The physical properties obtained from the two control reclaims and the three reclaim powders are recorded in Table VI. The reclaim powders compare favorably with the controls even over exaggerated aging periods.

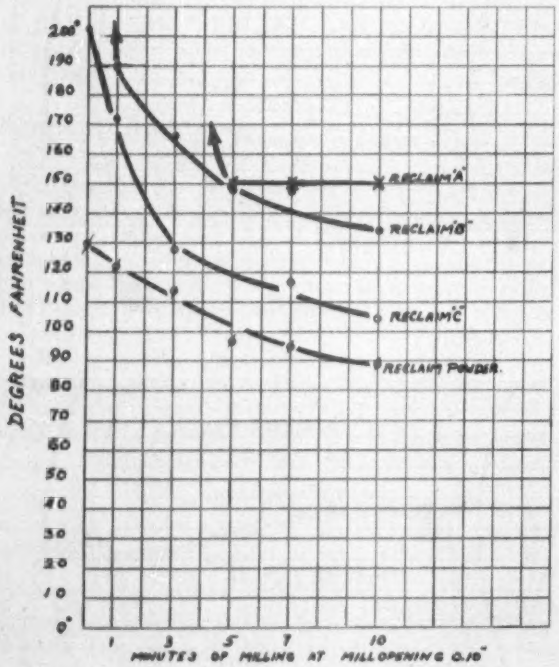

FIG. 1—Dispersion of carbon black in reclaim and reclaim powder.

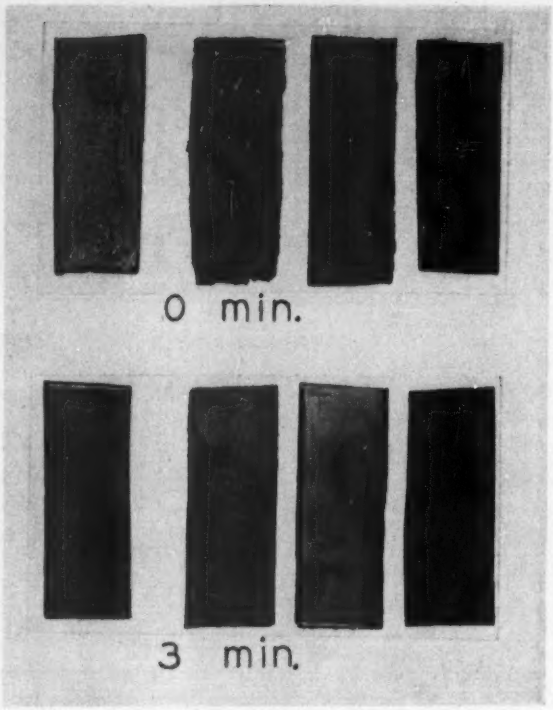

FIG. 2—Visual appearance of sample sheets from reclaim and reclaim powder compounds (Fig. 1) after 0 and 3 minutes of milling.

Measurements of Dispersion

Having noticed the behavior and apparent ease of dispersibility of these reclaim powders during Banbury and mill compounding, a measurement for this property seemed desirable. Previous experiments had shown that excellent photographic reproduction of dispersions could be obtained by the use of the autoradiographic technique with Carbon 14 *(2)*. In the meantime some experimental use of dielectric heating for the determination of dispersion of fillers had been carried out *(3)*. This was based on the principle that materials of low thermal conductivity, in this case the rubber compound, will develop heat uniformly and simultaneously throughout the entire mass, provided that the rubber compound is homogenous and that the field applied is uniform *(1)*. Previous work had indicated *(2)* that a poor dispersion of carbon black in a rubber compound would cause localized heat build-up during induction or dielectric heating. A very poor dispersion would cause ignition in localized areas and spot temperature rises.

For the purpose of these experiments, the conventional reclaims and the reclaim powder were mixed with carbon black in the Banbury. The proportions of carbon black were kept identical for all experiments. The conventional reclaims were given a 2-minute breakdown in the Banbury before the carbon black was added and then mixed with the carbon black for three minutes. No Banbury breakdown period was allowed for the reclaim powder. It was mixed in the Banbury mixer for three minutes.

The 3-minute mixing interval was chosen for both reclaim and reclaim powder because the conventional reclaims would not take up the carbon black added in any shorter time interval. The reclaim powder seemed to

TABLE VI—PHYSICAL PROPERTIES OF CONTROL RECLAIMS AND RECLAIM POWDERS

	Cure 287° F. (Min.)	300%	500%	Ten.	% El.	Shore	Tear	Sp. G.	% Rebound	HBU	Perm. Set	300%	Ten.	% El.	Shore	Tear	% Rebound	HBU	Perm. Set
		Original Tests										Aged 24 Hours at 100° C.							
Reclaim "A"	15	1090	2015	2080	525	55	305	—	—	—	—	1630	2160	390	63	148	—	—	—
	30	1395	—	2180	440	58	150	1.130	—	—	—	1910	2080	330	65	145	—	—	—
	45	1450	—	2150	425	58	145	—	58.0	76°	2.57	1845	2010	315	65	112	58.4	—	—
	60	1495	—	2110	405	59	120	—	—	—	—	—	1915	310	64	125	—	—	—
Reclaim "B"	15	690	—	1660	550	49	200	—	—	—	—	—	1500	275	59	110	—	—	—
	30	1060	—	2000	480	54	205	1.138	—	—	—	—	1530	305	62	115	—	75°	1.56
	45	1145	—	1985	450	57	165	—	55.4	77°	3.21	—	1680	300	61	100	55.4	—	—
	60	1135	—	1895	450	57	145	—	—	—	—	—	1475	283	61	105	—	—	—
Reclaim Powder "X"	15	860	1735	2100	590	51	295	—	—	—	—	1475	2225	440	63	375	—	—	—
	30	1220	—	2300	500	56	305	1.135	—	—	—	1705	2035	360	65	180	—	76°	2.30
	45	1275	—	2250	480	57	310	—	58.9	73°	3.4	1725	2145	370	65	205	57.9	—	—
	60	1310	—	2245	475	57	260	—	—	—	—	1635	2005	365	64	—	—	—	—
Reclaim Powder "Y"	15	745	1470	1810	600	52	335	—	—	—	—	1625	1895	350	64	300	—	—	—
	30	1110	—	2030	500	57	235	1.131	—	—	—	1620	2015	370	65	140	55.5	—	—
	45	1170	—	2130	495	57	300	—	57.0	76°	3.38	1580	2035	380	64	185	—	—	—
	60	1175	—	2085	485	57	280	—	—	—	—	—	—	—	—	—	—	—	—
Reclaim Powder "Z"	15	1075	2105	2195	525	57	370	—	—	—	—	—	1900	310	67	220	—	—	—
	30	1400	—	2385	485	58	340	1.136	—	—	—	1910	1975	310	67	190	—	75°	2.10
	45	1415	—	2065	435	60	270	—	56.4	76°	2.60	—	1870	290	68	145	57.9	—	—
	60	1410	—	2160	420	60	220	—	—	—	—	—	1770	285	66	160	—	—	—

	Cure 287° F. (Min.)	Aged 48 Hours at 100° C. Ten.	% El.	Shore	Tear	% Rebound	HBU	Perm. Set	Aged 96 Hours at 100° C. Ten.	% El.	Shore	Tear
Reclaim "A"	15	1645	250	68	100	—	—	—	1555	225	69	95
	30	1750	260	69	115	—	—	—	1655	240	70	100
	45	1835	275	68	108	58.0	73°	1.44	1780	240	70	115
	60	1750	265	67	110	—	—	—	1560	235	69	110
Reclaim "B"	15	1430	220	63	120	—	—	—	1415	285	63	85
	30	1580	280	63	100	—	—	—	1395	270	63	70
	45	1500	275	63	90	55.0	71°	1.45	1420	270	63	75
	60	1455	270	62	110	—	—	—	1615	—	63	100
Reclaim Powder "X"	15	1800	270	67	195	—	—	—	1825	305	68	135
	30	1750	265	68	145	—	—	—	1650	260	68	105
	45	1660	270	68	115	58.0	75°	2.19	1725	235	68	110
	60	1805	295	68	110	—	—	—	1525	245	68	120
Reclaim Powder "Y"	15	1610	255	67	105	—	—	—	1500	215	70	90
	30	1835	300	67	110	—	—	—	1645	240	69	100
	45	1670	270	69	100	55.0	75°	2.52	1510	240	69	110
	60	1600	275	67	100	—	—	—	1500	220	69	100
Reclaim Powder "Z"	15	1765	250	70	—	—	—	—	1540	225	67	95
	30	1815	270	68	135	—	—	—	1620	215	67	110
	45	1800	270	68	135	58.0	75°	1.95	1770	245	67	115
	60	1825	275	68	145	—	—	—	1540	215	68	115

have taken up the carbon black after two minutes of Banbury mixing. The amount of carbon black used was large, 50 parts of it being added to each 100 parts of reclaim. This is proportionate to the amount present in the compound recorded in Table IV. The Banbury batch size of the three conventional reclaims was kept identical; the batch size of the reclaim powder had to be increased to obtain proper working height of the ram.

After the Banbury mixing the batch was divided into equal parts and subjected to various intervals of milling on a cold mill at an opening of 0.10-inch. Six samples were obtained in that way from each compound. One sample was subjected to sheeting out only on the mill; the others were given a 1, 3, 5, 7 and 10-minute milling, respectively, before they were sheeted out. The thickness of the sheets was approximately 0.25-inch. These samples were put into an electronic oven and the heat developed after a given and constant time interval was measured.

Several measurements were carried out for each sample and the average temperature rise was reduced to an average thickness of the samples at the point of measurement. The average thickness could not be directly determined by gage reading because some of the samples, particularly those which were sheeted out only, did not have a perfectly smooth surface. Therefore, in each instance a known area, 1-inch by 0.5-inch, was died out and the apparent specific gravity of it was determined. The average thickness was then calculated from the following equations:

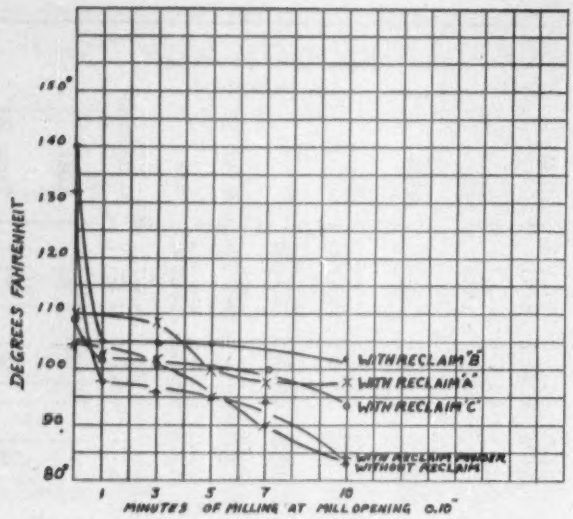

FIG. 3—Dispersion of carbon black in compounds containing GR-S, natural rubber and reclaim.

$$G = \frac{W}{V} = \frac{W}{A.T}; \qquad T = \frac{W}{A.G}$$

where, G = apparent specific gravity,
W = weight,
V = volume,
A = area, and
T = thickness.

The input into the electronic cabinet was 460 volts and the frequency was in the radio range, being 70,000,000 cycles per second. The rubber samples rested on a tray made from fabric impregnated with silicone rubber which, next to Teflon, is rated as the highest dielectric material. The upper plate carried 6000-8000 volts DC and 12000 to 16000 volts RF. The lower conducting plate is grounded. The total current going through a well-mixed sample was about 0.45 A. In a poorly dispersed sample the carbon black aggregates will carry more current, which is immediately recorded on the ammeter. If the sample has very poor dispersion the temperature will rise suddenly and local ignition results.

Fig. 1 records the results obtained. The reclaim powder showed by far the smallest increase in temperature at any given milling time and consequently seems to be the material having the best carbon black dispersion.

Fig. 2 represents the visual appearance of the sample sheets after 0 and 3 minutes of milling. The visual difference in appearance disappears after that time, but the temperature rise obtained by the dielectric heating method (Fig. 1) is still in favor of the reclaim powder even after 10 minutes of milling.

Identical experiments were carried out using a mixture of GR-S, natural rubber, reclaim and carbon black in the proportions shown in Table IV, as well as the same mixture, but replacing the conventional reclaim with a reclaim powder. Two blanks were run, one which contained GR-S and natural rubber only and one which contained the two rubbers plus carbon black. Fig. 3 shows the results obtained. Again the compound containing the reclaim powder appears to give a better carbon black dispersion than that containing conventional reclaims.

Fig. 4 shows a visual picture of the samples used. The three samples on the left were made with conventional reclaims, the sample on the farthest right is the blank prepared without reclaim, and the sample second from the right, is the one prepared with reclaim powder. The three samples on the left, as well as that containing reclaim powder appear, of course, smoother than the sample prepared without reclaim. The sample containing the reclaim powder and milled for three minutes did not bloom sulfur upon storage, whereas all the others bloomed heavily regardless of milling time.

Surface Appearance and Tack

Visual observation of the surface appearance, gloss and tack of the reclaims with carbon black and the reclaim powder containing carbon black, as well as of the compounds made according to Table IV, and milled according to the tests described for the dispersion measurements, was made. The observations are recorded in Table VII.

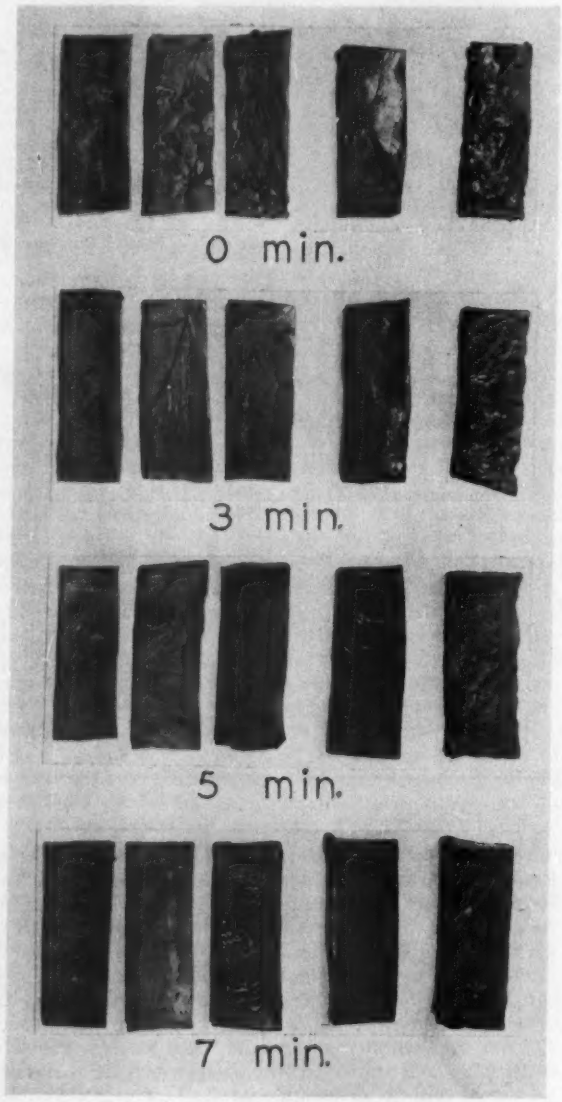

FIG. 4—Visual appearance of sample sheets from compounds covered in Fig. 3 after 0, 3, 5 and 7 minutes of milling.

Dispersion

The results obtained with the reclaim powder containing carbon black seem to indicate advantages in the dispersion of the black which did not appear to be realized by the use of conventional reclaims.

The carbon black, if present, appeared to become adsorbed onto the surface of the individual reclaim particles. This occurs during the actual reclaiming process and is visually demonstrated. Reclaim powders, when properly prepared, will be black to the touch before reclaiming. After reclaiming, however, they will be clean to the touch. Furthermore, demixing of the reclaim powder containing carbon black does not occur even after prolonged slow rhythmic agitation.

Quantitative analysis of the carbon black content at the top and at the bottom of two cylindrical containers containing two different reclaim powders showed identical results for the samples taken from the top and from the bottom of the containers before and after the abovementioned treatment. Other means of quantitative analysis, including screen analysis of various particle size distribution samples, were followed before and after reclaiming. However, the methods developed so far do not permit any further quantitative conclusions because several factors working at cross purpose, such as change in available surface area, swelling during the reclaiming process, and possible particle agglomeration, increase in particle size due to adsorption of carbon black particles, etc.

From the data available it seems, however, that the adsorption of the carbon black on the reclaim particles is not one which is comparable to that occurring during the reinforcing process of rubber by carbon black. On the other hand, the surface adsorption of the carbon black particles such as it occurs will provide in effect a predispersion of the carbon black in a purely physical sense. This predispersion can logically be expected to aid in the final reinforcing dispersion of the carbon black carried out in the mixing and compounding equipment.

Summary and Conclusions

Reclaim produced in powder form can be made to a uniform degree of reclaiming.

Analytical data are presented to show the properties of such reclaim powders as well as their behavior during compounding.

The data indicate that the reclaim powders discussed appeared to possess improved dispersibility in the compound. The physical properties compare favorably with those of conventional reclaims. Power consumption seems decreased and compounding batch sizes could be increased for an internal mixing machine of given volume. Reclaim powders also seem to mix cooler than conventional reclaims.

Dispersion was tested by measuring the temperature increase occurring in the sample and relating it to actual milling time. This method, while no doubt limited in accuracy, seems to provide a reasonable quick check on dispersion of compounding ingredients.

ACKNOWLEDGMENTS

The data which relate to the degree of dispersion of the carbon black component of the powdered reclaim were obtained on the electronic equipment of W. T. la Rose and Associates, Inc., Troy, New York. The actual tests were made by Messrs. S. T. Miles of that company and J. M. Ball of the Midwest Rubber Reclaiming Company. Thanks are also due to Mr. R. E. Cartlidge for his interest and advice.

TABLE VII—OBSERVATIONS OF VISUAL RESULTS

Sample	Milling (Min.)	Surface	Gloss	Tack
Reclaim A + Carbon Black	0	R	D	P
	1	M	D	P
	3	S	D	P
	5	S	D	P
	7	S	D	P
	10	S	D	P
Reclaim B + Carbon Black	0	R	D	P
	1	M	D	P
	3	M	D	P
	5	M	D	P
	7	S	D	P
	10	S	D	P
Reclaim Powder Containing Carbon Black	0	M	D	P
	1	M	D	P
	3	S	D	P
	5	S	D	P
	7	S	D	P
	10	S	D	P
Reclaim A in Compound Table IV	0	R	M	M
	1	R	M	M
	3	R	M	T
	5	M	G	T
	7	M	G	T
	10	M	G	T
Reclaim B in Compound Table IV	0	R	M	M
	1	R	M	M
	3	R	M	M
	5	R	M	M
	7	R	M	T
	10	R	G	T
Reclaim Powder Z in Compound Table IV	0	R	G	T
	1	R	G	T
	3	R	G	T
	5	M	G	T
	7	M	G	T
	10	M	G	T

RATINGS

R = Rough	G = Glossy	T = Tacky
M = Medium	M = Medium	M = Medium
S = Smooth	D = Dull	P = Poor

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(2) Kirshenbaum, A. D., Hoffman, C. W., and Grosse, A. V., *Anal. Chem.*, Vol. 23, pp. 1440-45 (Oct., 1951); repr. in *Rubber Chem. Tech.*, Vol. 25, pp. 291-302 (April-June, 1952).

(3) La Rose, W. T., and Miles, S. T., private communication.

(4) le Beau, D. S., patent applied for.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., has added a new model to its line of wet blasting machines. Known as **Model 30 Liquamatte,** it is intended for precision cleaning and finishing applications involving small pieces that can be lifted and handled manually.

Development of what is said to be the first gas-powered industrial truck with an electric transmission has been announced by the Automatic Transportation Co., Chicago, Ill. The unit, called the **Dynamotive,** features capacities which range from 4,000 to 6,000 pounds.

1—Latex storage tanks

2—Raw material handling and compounding area

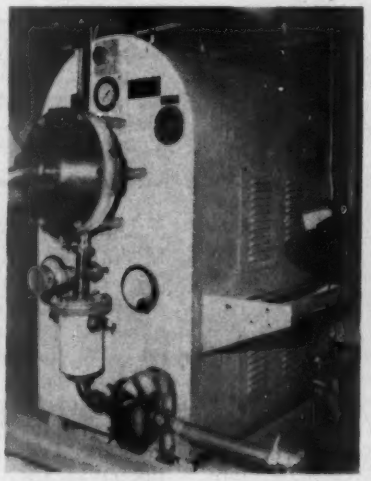
Latex Foam Production at Armstrong-Norwalk

SINCE August, 1952, the Pure Foam Division of the Armstrong-Norwalk Rubber Co. has been engaged in the production of foam rubber articles in a new and modern plant at Norwalk, Conn. The accompanying photographs depict the various operations which go into the production of a foam rubber article at the plant, from the earliest stages to the completed product. Figure 1 shows several of the latex storage tanks as they were being installed next to a railroad siding at the plant. The material handling and compounding area is shown in Figure 2. Ball mills, colloid mills and storage tanks for prepared dispersions are conveniently grouped for efficient handling. Dispersion storage tanks are equipped with stirrers to assure uniformity.

Figure 3 shows a close-up of a ball mill being charged in preparation for making a zinc oxide dispersion. The matured and temperature-adjusted latex mix is next metered into the Oakes continuous automatic foamer shown in Figure 4. The foamed latex compound is constantly checked for conformance to established requirements. The next step in the operation is the loading of the molds, as shown in Figure 5. The continuous production line is shown in Figure 6. Approximately six minutes elapse between the loading of each mold and its entry into the steam seal of the cure chamber. Figure 7 shows a vulcanized mattress being lifted from the mold after it has emerged from the curing chamber. Flash is trimmed from the vulcanized mattress, as shown in Figure 8, and the unit then enters into a combined washing and leaching operation as depicted in Figure 9.

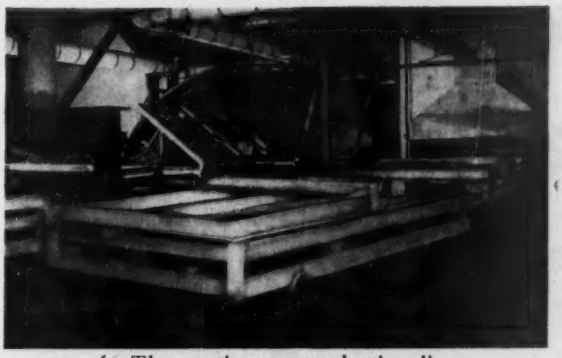
After any residual moisture is removed by passage through the dryer (Figure 10), the mattress is ready for inspection and final processing. Figure 11 shows the mattress being weighed and checked for conformance to compression standards. Pillows and upholstery cushions of various types are assembled from cored halves, one of which is shown being coated with neoprene cement in Figure 12. These halves are combined in matching pairs to form the finished product, as shown in Figure 13. The photographs used in this picture story appeared in the July, 1953, issue of *Vanderbilt News*. We are indebted to the Armstrong-Norwalk Rubber Co. and the R. T. Vanderbilt Co. for permission to reproduce them.

3—Charging a ball mill with zinc oxide

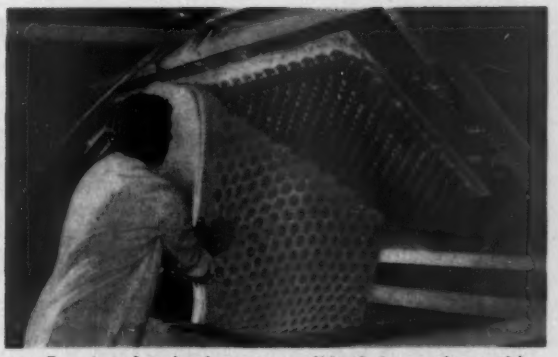


4—The Oakes continuous foamer used at the plant

5—Loading a mold as it moves along the production line



6—The continuous production line



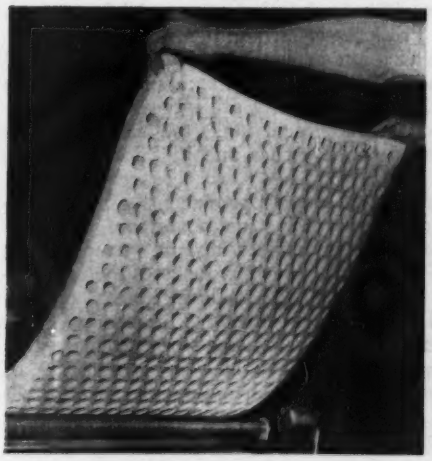
7—A vulcanized mattress lifted from the mold

8—The operator is shown trimming flash from the vulcanized article prior to washing

9—Passing through squeeze-rolls under water sprays in water-leaching operations

10—The article entering the dryer for removal of residual moisture.

11—Compression test measures the load required to produce 25% deflection



12—The cementing operation is shown to the left

13—The operators to the right are combining the matched pairs

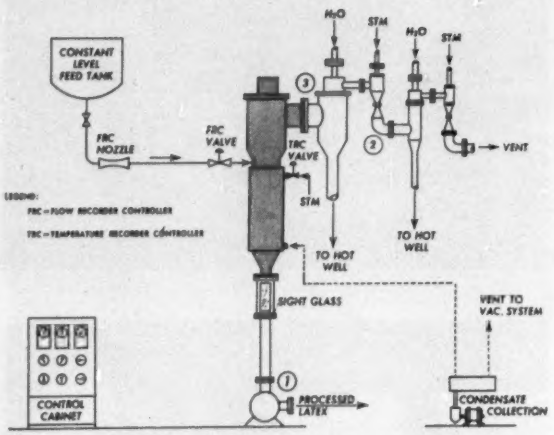
Stripping and Concentration of Rubber Latices

MONOMERS or ammonia can now be stripped from natural, synthetic and plastic latices with the patented "Turba-Film" Evaporator, a product of the Process Equipment Division of the Rodney Hunt Machine Co., Orange, Mass. The latex is continuously processed and concentrated at low temperatures—in a 20-second single pass. Among specific advantages claimed for the new evaporator, already in use in several plants, are these: The latex has superior physical properties with negligible loss of material as coagulum, stripping is more complete, higher solids content is obtained, and product loss in the vapor stream is practically eliminated, even with products which foam badly.

The Turba-Film Evaporator, according to Rodney Hunt engineers, can be successfully regulated to overcome processing difficulties such as (1) coagulation due to shearing action, (2) films formed by air drying, (3) sensitivity to heat and changes in pH, (4) increase in viscosity with increased concentration, and (5) tendency to form stable and copious foam.

Stripping and concentration are done in one pass; further concentration can be accomplished by a second pass or by a second evaporator. The Turba-Film unit allows precise and positive control of all operating conditions and "U" values as high as 370 have been obtained. (U value = BTU/hr/°F./M.t.d./sq. ft./heat-transfer area).

Typical of the results obtained with the Turba-Film Evaporator are those occurring when natural rubber latex is processed in this equipment. This material is easily stripped to practically any ammonia alkalinity. Rates of 180 lbs. of latex/hr/sq. ft. of heat-transfer surface have been obtained while reducing total alkalinity content from 2.0% to 0.55%. Total solids content has been increased from 62 to 64% at 100°F. Lower solids feed is easily concentrated to a maximum of 68% to 70%. Ammonia can be almost completely removed; practically no coagulum is produced.



Flow sheet of latex stripping and/or concentration plant.

Notes: (1) Blow case vacuum receivers are used for some products. (2) Surface condenser or compressor is used when monomer recovery is desired. (3) Foam trap may be installed if desired.

Another example involves GR-S. Tests show 39% total solids feed can be concentrated to 66% with almost complete styrene removal; practically no coagulum is produced. The viscosity of concentrate is much lower than can be obtained by other processes. Feed rates go up to 60 lbs/hr/sq. ft. of heat-transfer surface.

Plastic latices can be processed at rates similar to natural rubber latex and GR-S. The new evaporator can successfully remove substances such as styrene, acrylonitrile, butadiene, vinyl chloride and chloroprene. Unusually high solids content has been obtained for a wide range of products.

Laminex Fiber Glass Tanks

Sturdy, corrosion-resistant fiber glass tanks in special sizes are now being fabricated by the Laminex Corporation of Fall River, Mass., doing away with the cost of special molds. Formerly, according to Laminex, the necessity for making a mold in order to produce only a few tanks in a special size resulted in exorbitant prices. The new technique of fabricating tanks from Laminex fiber glass flat stock, however, keeps the cost down—less than aluminum and far less than stainless steel tanks to do the same job.

Laminex is now building tanks to order in all wanted sizes from the smallest possible up to a maximum of 12-foot length or width by 4-foot depth, or 12-foot length and width. Product is straight-sided and square-cornered, with all joints pressure-bonded, and engineered so that thickness increases for maximum strength in proportion as size and capacity are increased. Depending on size of the individual tank, the flat top flange varies in width up to 4 inches and in thickness up to ½-inch.

Like all Laminex fiber glass products, the new fabricated tanks are non-corrosive inside and out, are electrically non-conductive, and withstand temperatures above the boiling point. They withstand chemical attack from all commonly used acids in normal concentration. Walls of uniform thickness, reinforced with horizontal ribs where necessary, register extremely high impact resistance. Extreme light weight and ease of cleaning reduce labor cost of handling materials. Ease and speed of repairs, made by unskilled labor on the spot, save money and operational time.

The Use of the Mooney Plastometer to Disclose Structural Effects in High Polymers

By D. S. FENSOM

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For plant control a useful and convenient rheological measurement on synthetic rubber would seem to be the Mooney Plastometer test. Refinements of this procedure are suggested which appear to be correlated with structural differences in the rubbers under examination. Examples of results of two polymer types are given to support these proposals.

THERE has been a tendency in the study of synthetic rubbers to search not only for the average molecular weight of a high polymer but also for signs of branching, cross-linking and heterogeneity of molecular types. For instance, attention is not only paid to intrinsic viscosity $[\eta]$ in dilute solution but also to the association or heterogeneity factors such as the k′ in the relation $\eta\,Sp/C = [\eta] + k'[\eta]^2c$ *(1)*. A type of viscosity measurement on synthetic rubber may be achieved by means of the Mooney Plastometer test *(2)*. It is the purpose of this note to point out, as Mooney himself has pointed out, that this test may be refined to disclose some of the other factors in addition to the fluidity of the polymer. Some theoretical grounds for this point of view will be advanced below, but first some experimental tests and comparisons should be described.

Experimental Methods

(A) Mooney Plastometer Tests: A standard Mooney machine, fitted with a large rotor, was used throughout. The platens were maintained at 212°F. by pressure-controlled saturated steam. Samples under test were installed in the cavity in the conventional manner and were allowed to warm for 1 minute, with the platens closed, before the motor was turned on. From zero time (motor start) readings of torque were taken every 30 seconds for ten minutes. Results have been expressed graphically in Figs. 1 and 2. Polysar-S (GR-S) polymers were measured both with or without preliminary massing on a warm mill. (See Table II).

Note: This paper is based on a talk given by the author at the High Polymer Forum, Chemical Institute of Canada, Montreal, Canada, June 2-4, 1952.

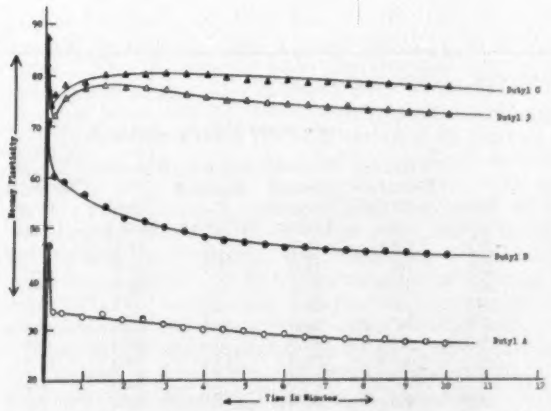

FIG. 1—Mooney plasticity-time curves for Butyl rubbers (214° F., unmassed samples).

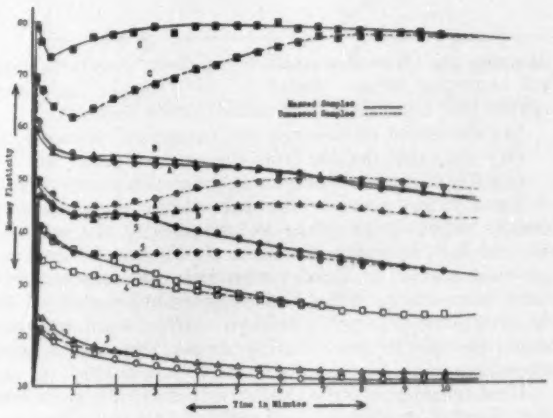

FIG. 2—Mooney plasticity-time curves for Polysar (GR-S) rubbers (214° F.).

(B) Dilute Solution Viscosity: The samples of rubber which had been tested for Mooney value were dissolved in toluene and the solution viscosities measured in an Ubbelohde viscometer at 25°C. and at concentrations less than 0.5 gm./100 ml. This procedure gave measures of $[\eta]$ and of k′. The values are listed in Tables I and II.

(C) Concentrated Solution Viscosity: Portions of the same samples were dissolved in toluene to concentrations of 5% and 20%. The viscosity of these solutions was measured at various rates of shear by a Brookfield viscometer. Viscosity-concentration factors and the reduction of apparent viscosity with increased rate of shear were measured and are listed in Tables I and II. High viscosity concentration factors are indicative of molecular association *(3)* as is also high reduction in apparent viscosity with increased shear (termed by some, thixotropy).

General Shape of Mooney Time Curves

The first set of polymers to be examined was a group of Butyl samples, of widely different Mooney value. Some of the results are in Fig. 1. The results for the GR-S samples are in Fig. 2.

It would appear that the Mooney-time curves for Butyl rubbers which lie within the specification of 70-80

TABLE I—BUTYL RUBBER SAMPLES

Sample No.	Description	[η]	k'	Log Conc.	Viscosity Reduction 6-60 rpm (%)	Mooney Standard Value at 4 mins.	Mooney Modulus Ext. (°/sec.)	Analysis Yield (deg.)	Analysis Secondary Rise (deg.)
	⌐10-15% Toluene by Wt.¬								
A	Green-black almost plastic v. high sediment. Marked cold flow	1.21	.34	.252	14.7	30.0	7.7	46.5	None
B	Amber, transparent, no sediment visible. Slight cold flow	1.08	.38	.213	1.0	48.0	14.0	71.0	None
C	Grey-white, tough and crumbly. Negligible cold flow	1.30	.34	.255	4.4	80.0	18.0	87.5	6.0
3	Amber, tough. Little cold flow	1.31	.35	.240	6.3	75.0	21.0	82.0	6.0
1	Amber, tough. Little cold flow	1.36	.31	.235	4.2	76.5	21.0	85.0	4.5
2	Amber, tough. Little cold flow	1.35	.34	.235	6.5	76.5	20.0	87.5	4.0
5	Amber, tough. Little cold flow	1.35	.33	.233	5.4	75.5	27.0	85.5	4.5

Mooney are quite characteristic of these materials, typical examples being "Butyl C" or "Butyl 3". These curves may be divided into three discrete sections:

(a) the initial sudden rise or "extension" section;
(b) the rapid decline from the original peak, and
(c) the main flow portion of the curve.

Since it was possible that part of the shape of these curves might be caused by peculiarities of the machine, unrelated to rheology, the most obvious mechanical and physical sources of factors other than rheological effects have been considered. Such a spurious record of the Mooney curve might result if rubber were extruded down the spindle shaft during a run. No indication of extrusion down the spindle shaft was seen.

Heat transfer into the rubber will always be slow since the thermal conductivity of rubber is low. However, thermocouples inserted in the cavity of the Mooney machine showed that the temperature of the samples rose rapidly at first in the period of conditioning. If the period of conditioning were raised to 3 or 5 minutes, there was not appreciable alteration in the shape of the curve. After one minute of conditioning, the thermocouples in the machine cavity read 208°F. Since the viscosity is related to the logarithm of the Absolute temperature, a difference of 5°F. in the vicinity of 212°F. (373° K) should result in a difference of less than 1% of flow force.

Thus, for rubber samples having standard Mooney values of less than 60, the heat transfer effect would not seem to exert a major influence on the Mooney curve. But when the rubber viscosity exceeded 60 or 70, it was found that a "secondary rise" occurred in the Mooney curve of Butyl rubbers within the first minute of flow (see Fig. 1). This rise was diminished with increasing temperature and time of conditioning.

As direct evidence was accumulated against any true increase of sample viscosity during the test, it may be suggested that the secondary rise is a result of peculiar heat transfer when the viscosity of the Butyl rubber sample is very high. For instance, the rotor at the start of a run is surrounded by cold rubber and may have cooled off between tests. The portion of rubber sample near the outer walls of the cavity will be at much higher temperature *(6)* than the cool slug around the rotor and the main shear forces will therefore tend to operate across a fluid lamina somewhere inside the machine. The initial heating will be augmented by the temperature rise caused by rapid extension. As shear progresses, however, the flow forces will become distributed throughout the inner and outer rubber masses also, and an apparent rise in viscosity will result before the rotor has revolved twice (i.e., before 1 minute of flow).

With a uniform temperature of sample or with samples of low viscosity this shear force gradient became more evenly distributed across the cavity and the secondary rise would not be noticeable. Again, a higher flow force would produce a higher temperature rise across the flow lamina, which in turn would register as a sudden drop from the initial extension peak.

Air inclusions will always tend to be a source of irregularity. The effect is reducible to a minimum through the pressure exerted by the Mooney platens on the rubber samples. In Butyl rubbers, which have already been extruded in processing, air inclusions in the rubber were very slight, if any.

TABLE II—GR-S RUBBER SAMPLES (UNMASSED).

Sample No.	Description	[η]	k'	Log η/Conc.	Viscosity Reduction 6-60 rpm (%)	Mooney Analysis — Massed Samples — Standard Value at 4 mins.	Mooney Analysis — Massed Samples — Modulus Ext. (°/sec.)	Mooney Analysis — Massed Samples — Yield (deg.)	Unmassed Samples Secondary Rise (deg.)
2	Pilot Plant batch, 43% conversion	1.33	.34	.283	59 *	12.5	1.9	21.0	—
3	Pilot Plant batch, 52% conversion	1.30	.38	.258	45	14.0	1.9	23.0	—
4	Pilot Plant batch, 59% conversion	1.78	.35	.302	51 *	29.0	3.2	41.0	—
5	Pilot Plant batch, 72% conversion (final)	1.98	.39	.272	10	40.5	3.6	46.5	0.5
A	72% conversion	2.23	.46	.354	32	52.0	6.1	61.0	4.5
B	72% conversion	2.33	.42	.291	22	53.0	8.6	60.0	2.5
C	73% conversion	+3.03	.47	+.50	>60 †	79.0	11.1	79.0	15.0
D	Ref. stand. S-50-853	2.245	.40	.312	20	50.5	5.5	66.0	1.5
E	Ref. stand. T-4386	2.30	.35	.305	6.5	53.0	5.0	60.5	1.0

* High gel noted. † Very high gel.

The use of a standard technique on the Mooney machine, and the use of the same machine throughout tests, reduced the effect of the factors which might interfere. At least the curves were entirely comparable with each other and were reproducible to within one Mooney point.

Rubber Extension

As the rotor was started the shearing force was seen to rise rapidly to a high value after which a sharp decline occurred. In samples of Butyl rubber this peak was reached in about 3 seconds. In Polysar-S samples the time was around 10 seconds. Since the rotor of the plastometer moved at 2 r.p.m., it had time to move from 1/10 to 1/3 of a revolution before reaching the peak of rubber resistance. This may be interpreted as the extension of rubber before flow sets in. (Any slackness in the gear chain or spring must also be involved in this portion of the curve).

According to Mark and Tobolsky *(4, 5)*, the equation of state for rubber deformed in shear is:

$$f = N k T \gamma$$

where f = stress (the Mooney reading)
γ = shear strain (directly proportional to t, the time of extension)
kT = Absolute temperature and Boltzman's constant
N is the number of network chains per unit volume of rubber and hence depends on both the molecular weight of primary molecules and on the number of cross-links existing between moelcules.

With this picture in mind, a measure of the modulus of elasticity at a fixed temperature $f/\gamma = f/t$ should give a combined measure of molecular weight and cross-linking as long as slackness in the gear chain is small. Thus, where molecular weights are nearly the same (as with Butyl C and 3, or with Butyls 1, 2 and 5 in Table I) the cross-linking should increase with increased modulus. Fig. 3 shows that the modulus increased together with the k′ value for Butyl rubbers of comparable intrinsic viscosities.

The significance of the "Yield Point" on the Mooney machine is not as easy to relate to an accepted theory, but would seem to be the sum of the force required to overcome the entropy factor (alignment) and the force required to cause flow or slippage between adjacent chains.

Rubber Flow

The beginning of true flow, in the samples tested, seemed to coincide with a rapid decrease in Mooney value. This decrease probably accompanied a small adjustment in temperature in the rubber. If structural differences enter into the flow at this stage, as is also possible, they should show up as a variation in the rate of decrease in Mooney value. Again, the flow of whole molecules may decrease to that of segments only and show a corresponding decrease in Mooney value. However, the combined effect of temperature, air inclusions, bond-making or breaking, and alignment of molecules, will require further study to sort out the contribution of each factor. (Nonetheless it is possible to make one or two comments about the present experimental data).

Mooney and his colleagues *(2, 6)* have noted this initial decline in flow force and have suggested that it is evidence of "thixotropy" i.e., bond-breaking. They have carried out temperature measurements with thermocouples in the sample which show that after 1 minute's

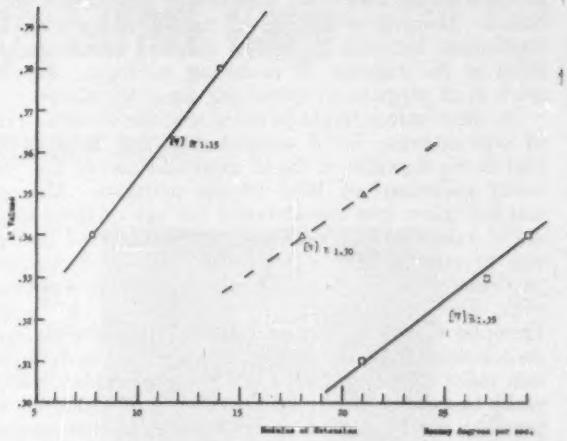

FIG. 3—Butyl rubber samples (k′ vs. modulus).

conditioning the samples were still about 8°F. below the machine temperature. This would lead one to expect a decrease in flow force (Mooney value) of the type observed in the Butyl rubber samples of Fig. 1. But Mooney has also shown that not all rubbers display such a decrease in flow viscosity, particularly if the rubber had previously been massed. One explanation of this lack of decrease might be the result of a higher viscosity as air became removed. However, another explanation would be the occurrence of bond-making processes which would be assisted by high temperature and shear.

Examination of Tables I and II in this present survey showed that Butyl rubbers had rates of decrease from 50 to 70 Mooney units/minute, while Polysar-S types had rates of 8 to 18 Mooney units/minute. Massing had the effect of raising the modulus slightly (except where there were indications of very high gel), raising the yield point and increasing the rate of decline during initial flow. A greater density of sample, resulting from air removal, should be expected to raise the modulus and the yield point, but if heat transfer in the first minute of flow is at all important, air removal would probably improve heat transfer and thus induce a more rapid initial lowering of flow viscosity.

Increase in Flow Resistance or Secondary Rise

A glance at Figs. 1 and 2 will show that many rubbers exhibited a secondary rise in their Mooney flow curves, particularly when the viscosity of the sample was high. This rise was ascribed by some plant operators to the squeezing out of air in the sample under test. This explanation seemed to be inadequate since Butyl rubber samples showed a secondary rise within the first minute of flow, a rise which could not be due to the removal of air inclusions and which has now been explained by peculiar temperature conditions and laminae of flow. In GR-S rubbers the secondary rise took place after the first minute of flow and could not be removed by longer conditioning time for the sample in the machine, nor by raising the temperature of the test. Some real increase in the flow resistance of the sample appeared to occur.

Two possible explanations may be advanced for the secondary rise in GR-S rubbers. Under conditions of high shear and temperature, with air inclusions present, a certain amount of bond-making or oxygen cross-linkage may occur before oxygen degradation becomes marked. Alternatively, the emulsion polymerization may

produce chains which are inter-linked rather than intra-linked. Massing or mixing will tend to increase the entanglement between chains of different emulsion particles at the expense of uncurling microgel. Further work is in progress to investigate these hypotheses.

In either case it might be noted that the secondary rise of high viscosity GR-S samples shown in Table II varied in the direction of the k′ value and also of the "viscosity reduction" of 10% toluene solutions. Microgel was not taken into consideration for any of these original k′ values, although it has since been found that gel was present in large quantity in some GR-S samples, particularly C. High visible gel was certainly associated with high cross-linking as indicated by k′ values (samples C and 4), but since the k′ values are obtained on solutions from which the gel has largely been filtered out, much of the really heavily branched rubber will already have been removed and the remaining solution will possibly no longer be representative of the original sample. The percent viscosity reduction in 10% toluene was much increased by the presence of gel.

Discussion

The theoretical grounds for a relation between "Mooney Value" and viscosity appear to be quite well advanced, but this is not the case for measurements of branching. However, by using the Mooney Plastometer to measure the initial modulus of extension of the rubber, by means of an automatic recorder, there are good theoretical grounds for expecting the modulus to indicate at comparable rubber viscosities the degree of branching and linkage shown by the sample. Although the samples tested and analyzed in this paper are not numerous, they do show a correlation between modulus and k′ values on the one hand and between modulus and "viscosity reductions" on the other, both of which are indicative of molecular association. This correlation was particularly indicated for Butyl rubber samples.

The flow curves of these rubbers in the Mooney test do not seem to be as amenable to established lines of theoretical analysis as either extension or relaxation curves. Nevertheless, rate reactions involving the making or breaking of available bonds are possible, and in these samples probably occur, despite the masking effects of temperature changes, possible air inclusions and even uncoiling of emulsion units. Further study should largely clarify the temperature and mechanical defects. In the meantime, this preliminary examination of the Mooney curves has shown an empirical correlation between the measure of branching and the secondary rise in the flow curve. The reason for this correlation has yet to be clarified; it is hoped, by further study.

One final point. The massing of GR-S rubbers obviously causes such a change in properties of the sample that if fresh linkings or enmeshing occur, they may no longer be shown after the massing operation. Thus, for purposes of examination of possible branching in plant production the sample should be, as nearly as possible, untreated so that massing effects may be caused in the Mooney machine and shown clearly rather than be overlooked.

ACKNOWLEDGMENTS

A grant-in-aid by the National Research Council is gratefully acknowledged. The use of equipment and opportunities for discussion were generously donated by Polymer Corporation Limited. Laboratory assistance was provided by Bruce Chidley.

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New Surface-Treating Process for Polyethylene Film

A NEW surface-treating process for polyethylene film increases ink adhesion, speeds up press runs, lowers printing costs, and helps solve the major problems of printing on this versatile packaging material. The new process, developed by Chester Packaging Products Corp., Yonkers, N. Y., is a special surface treatment for film made of Bakelite polyethylene resins.

According to the manufacturer, the new treated film, called Cheslene TF, can be printed by a wide number of different and faster printing processes with maximum coverage and high uniformity of impression. More brilliant color, greater design possibilities and better printing permanence are obtained with Cheslene TF. By improving point-of-sale appearance with printing, the new process is expected to broaden future use of packaging film made of Bakelite polyethylene resins.

The present wide demand for polyethylene film in packaging applications is based on its combination of toughness, translucence, flexibility at sub-zero temperatures and resistance to moisture and most chemicals. Film only thousandths of an inch thick made of polyethylene resins also has remarkable properties as a water vapor barrier which at the same time lets through more oxygen and carbon dioxide than most films. These properties make the film an excellent packaging material for foods—fresh, frozen or prepared.

The new surface treatment for polyethylene film solves many printing and design difficulties and helps create greater sales of packaged goods through better presentation on store shelves. Cheslene TF is expected to find much wider use as both unsupported film and as a lamination to other flexible packaging materials of all kinds and types.

Increased printability is assured by the new special treating process, according to Chester Packaging Products Corp., because of greater ink adhesion and much higher resistance to rub-off. The need for overcoating the film after printing is also lessened by the new process, while the number of usable printing processes and the package designer's scope are increased.

A New High Range Strain Gage

By JAMES A. HURRY[1] and RICHARD P. WOOLLEY[2]

IN recent years experimental stress analysis has increased in importance until now few machines are designed without its direct application and nearly all products benefit at least indirectly by its use. A large number of techniques have been developed for the measurement of strains in structures. These techniques include the use of mechanical and optical strain gages, photoelasticity, and brittle lacquers, but the most versatile instrument yet devised for the measurement of strain is the resistance wire strain gage.

The resistance wire strain gage is a small wire grid, perhaps one-fourth by one-half inches, which can be bonded directly to the structure under investigation. Its electrical resistance varies with strain. The resistance can be measured and recorded continuously from a remote station.

This instrument has two serious disadvantages from the standpoint of the rubber engineer. First, it is useable to only about 3% elongation in a cyclic system, although it can be used up to 30% elongation if the strain is monatomic. Second, the modulus of elasticity of the gage is so much higher than that of rubber that the presence of the gage very seriously modifies the stress distribution in a rubber structure.

A new high range strain gage which has been developed in our Physics Laboratory overcomes these two drawbacks without sacrifice of the desirable features of the resistance wire gage.

Description

The high range strain gage consists of a rubber tube three to six inches long with an inside diameter of four to eight thousandths of an inch, filled with mercury. Electrical connections are made to the mercury column by means of copper wires, which also seal the ends of the tube. To conserve space, the tube is folded back and forth on itself. The electrical resistance is a measure of strain.

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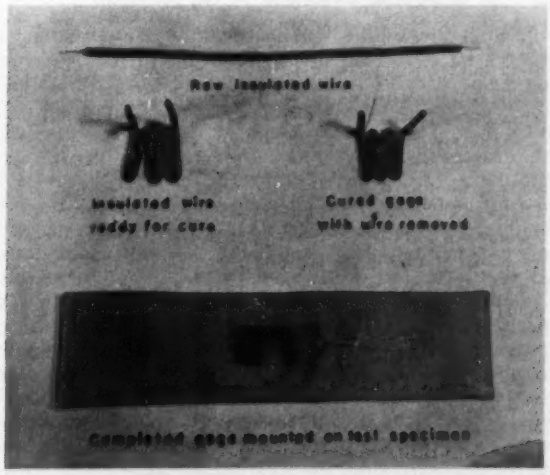


FIG. 1—Steps in the construction of a gage.

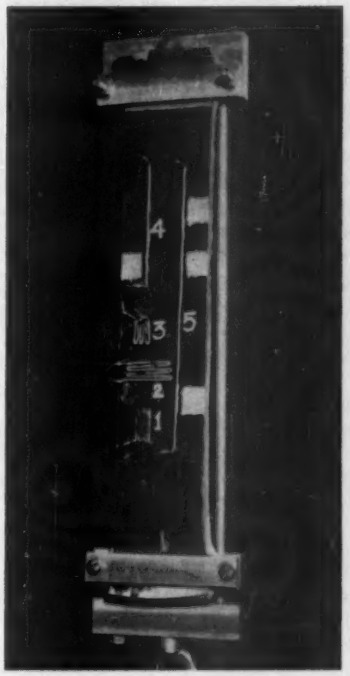


FIG. 2—Gages on test specimen.

Method of Construction

The steps in the construction of a gage are illustrated in Fig. 1. Fine steel wire is insulated with raw rubber. This insulated wire is bent to the shape of the finished gage, and then vulcanized. After vulcanization the wire is removed from the rubber. The result is a tube of very uniform bore even at the sharp bends. This tube is cemented into place on the structure to be tested, or cured inside the structure with the ends protruding. The tube is filled with mercury through a glass tube drawn to capillary size, and the ends are plugged with amalgamated copper wires. These wires are cemented or tied in place. Fig. 2 shows several completed gages in place on a test specimen.

Using

$$R = \rho \frac{l}{A}$$

for a mercury column,
where R = resistance,
ρ = specific resistance (resistivity),
l = length, and
A = cross-sectional area,
it can easily be shown that

$$\left.\frac{dR/R}{dl/l}\right]_{\substack{\text{Vol.}\\ \text{Const.}}} = g = 2.$$

A theoretical analysis was made of the errors involved. Three sources of errors were considered, namely:

1. Lateral strain error in the folded gage as the gage is stretched or compressed in the longitudinal direction.
2. Stray series resistance.
3. Effect of the cement.

Using a Poisson's ratio of $\phi \leqq \frac{1}{2}$ it can be shown that the lateral strain error for a gage 11/32-inch x 1/2-inch will be less than 1.4%.

In consideration of the second error it will be noticed that the plot of log R versus log l (Fig. 3) is only very slightly concave upward. This deviation from linearity is attributed to stray series resistance. Series resistance effect can be reduced until it causes an error of less than 2% in the determination of the strain. As an alternative the resistance can be measured and its effect completely eliminated by calculation.

A third source of error is the cement—a salient effect—when you are dealing with highly distensible materials and products. When a structure with a gage cemented to its surface undergoes a tensile strain, the cement strains in shear. Thus, the gage does not stretch as much as the structure. Since this effect occurs primarily at the ends of the gage, it is more pronounced with a short wide gage than with a long narrow one. In the non-ideal case, in which the cement strains in shear, it has been shown experimentally that

$R = KL^b$ $\quad b \leqq 2$ $\quad L =$ gage length on structure under test,

where R = gage resistance,
L = gage length on the surface to which the gage is cemented, and
K and b are constants.

It can easily be shown that

$$\frac{dR/R}{dL/L} = b.$$

In effect then b = g where "g" is the gage factor.

It is seen, then, that this end effect is manifested simply as a reduction of gage factor. The error can therefore be completely eliminated by direct single point calibration. Fig. 3 illustrates the variation in "g" from gage to gage.

Experimental Results

Five high range strain gages of different physical dimensions were cemented to a 2 x ½ x 12-inch strip of rubber using 3M Weather Stripping Adhesive (see Fig. 2). Bench marks were scribed on the strip. At various degrees of strain, distances between bench marks and gage resistance were measured. The results are shown in Fig. 3.

Several high range strain gages have been subjected to strain varying sinusoidally from 0 to 50% at a frequency of twelve cycles per second for several thousand cycles without shift in calibration and without signal distortion.

It appears from work done so far with the high range strain gage that the limitation in the range of strain sensitivity depends primarily on the development of adequate cements.

Conclusions

A new instrument for the experimental measurement of strain has been developed. This instrument, the high range strain gage, exhibits excellent accuracy far beyond the limit of previous resistance type gages. It will probably prove useful at all frequencies commonly encountered in strain measurements.

The high range strain gage fills a vital need, not only in the rubber industry, but also in post-yield metallurgy and all other fields where large strains are encountered.

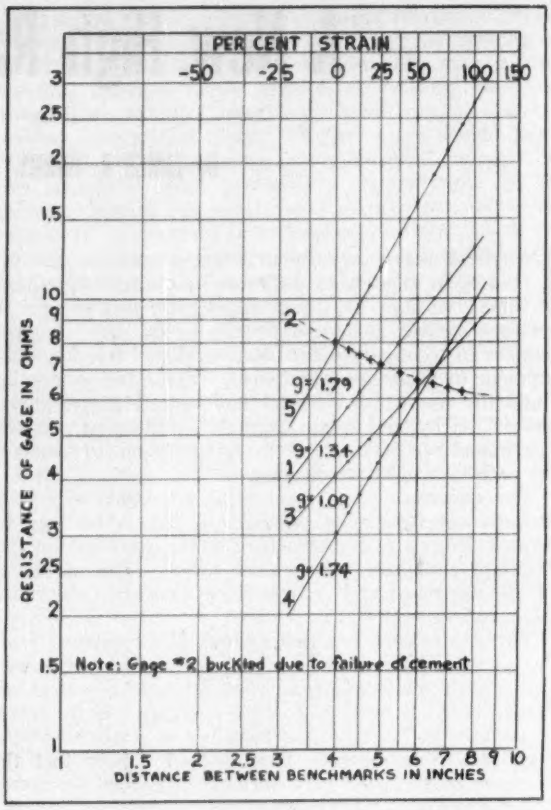


FIG. 3—Variation in "g" from gage to gage.

Brilmayer Electronic Metal Detector

A new type of electronic metal detector, which is capable of detecting all types of magnetic or non-magnetic metal, has been developed by E. W. Brilmayer Laboratories, Inc., 86 Fulton St., New York 38, N. Y. The unit is composed of three parts: (1) the detector, which consists of two enclosed coils with an aperture between them, through which the product for inspection is conveyed by belt or non-metallic chute, pipe or gravity; (2) a power supply unit containing a high frequency oscillator and voltage regulator, and (3) a reject mechanism. A particle of metal in the product passing through the detector aperture causes a shift in the magnetic field which produces a signal voltage which is amplified and energizes a relay that, in turn, operates the rejection mechanism. Although the flow can be halted and the contaminated product removed, the company furnishes solenoid-operated shunt gates, trap gates or pneumatic rejection devices which reject the contaminated product and automatically reset the unit.

Silicone Elastomers

A Panel Discussion Held at the February 5, 1953, Meeting of the Fort Wayne Rubber and Plastics Group

AS previously reported, the February 5, 1953, meeting of the Fort Wayne Rubber and Plastics Group, held at the Hotel Van Orman in Fort Wayne, Indiana, featured an interesting panel discussion on "Silicone Elastomers." S. M. Lillis (Victor Manufacturing) acted as moderator for the session, and the panel included J. Deasy (General Electric), who spoke on "Polymer Production"; G. Konkle (Dow Corning), whose subject was "Applications and Properties"; P. G. Magner, Jr. (General Tire), who discussed "Tubing and Calendering," and J. E. Martin (Williams-Bowman), who handled "Molding and Curing." Following the presentation of the talks a brief question-and-answer period was held. The talks presented, as well as the questions asked and the answers given by members of the panel, follow:

Polymer Production

By J. DEASY

General Electric Co., Waterford, N. Y.

WHAT is silicone rubber? Silicone rubber is a mixture of fillers, catalyst, and a certain polymeric substance consisting of carbon, hydrogen, oxygen, and silicon that may be fabricated into useful elastomeric products at a profit. Let us now take this definition apart and analyze the basic features of a silicone rubber. How does one proceed from a shiny, gray, friable, hard lump of silicon to a translucent, flexible, elastomeric sheet of silicone rubber?

The silicone polymer is the backbone of any silicone rubber and it is the result of a carefully controlled chemical process that is designed to produce an extremely pure difunctional material. The preparation of this polymer starts in a cylindrical reactor into which finely crushed silicon and a copper catalyst are charged. Methyl chloride is passed through the reactor bed which is held at prescribed temperature and pressure limits as dictated by the thermodynamics of the direct process reaction. The stream from the top of the reactor contains dimethyldichlorosilane, the desired product, as well as other reaction possibilities, such as methyltrichlorosilane, trimethylchlorosilane, silicone tetrachloride, and hydrocarbons.

The various silanes in the reactor overhead stream are condensed and piped to a still where the mixture is rectified. This rectification process is complicated by close boiling points; consequently, additional techniques of securing a pure difunctional material are usually employed. One of these techniques consists of the hydrolysis of the dimethyldichlorosilane from the still. This hydrolysis process forms intermediates that may be separated rather easily into components possessing the required degree of purity or difunctionality. These intermediates may then be condensed with either acidic or basic catalysts to form polymers of high molecular weight. The silicone rubber gum (which is generally a polymethylsiloxane) ranges from 300,000 to 500,000 in average molecular weight, is colorless, has a viscosity of about ten million centipoises, and acts quite like a high viscosity oil. Such a gum exhibits very good compounding properties with a variety of fillers.

Some of the fillers used in compounding silicone gum are silicas (both manufactured and naturally occurring), metallic oxides, carbonates, and silicates. Since a large fraction of the silicone rubber produced is used in applications requiring high temperature duty, organic type fillers cannot be used, and the inorganic fillers used have to be free from acid- or alkali-producing impurities at the application temperature involved. The inorganic fillers mentioned are usually incorporated with the silicone gum on a two-roll rubber mill. A complete silicone rubber compound is made by adding a catalyst.

The forming operation in silicone rubber fabrication is usually performed with heat and pressure in conjunction with a catalyst that produces oxygen containing free radicals. Popular catalysts for silicone rubber compounds are benzoyl peroxide and tertiary butyl perbenzoate. With the addition of the catalyst we have a finished silicone rubber compound. This compound contains only three components — silicone gum, filler, and catalyst. Other components such as colors and particularly compression set additives may also be employed, but a silicone rubber compound is distinctive because of the few components that are necessary to produce it. It is well to remember that anything that is added to a silicone rubber compound must be compatible with the peroxide, free radical, curing mechanism, and also the probable high temperature performance to which the rubber is usually subjected.

Silicone rubber compounds may be fabricated with the usual rubber industry equipment. Compression and transfer molding, extrusion, calendering, and coating operations have been carried out without any major difficulty.

Applications and Properties

By GEORGE KONKLE

Dow Corning Corp., Midland, Mich.

THIS section covers briefly the most important properties of silicone rubber and lists a few applications where these properties are being utilized. The most important properties of silicone rubber are stability at high temperatures, oil resistance, low temperature flexibility, good characteristics and resistance to the effects of outdoor weathering. Silicone rubber has as its outstanding feature stability at high temperatures. It is usable for extended periods of time at 300° to 400° F. and performs satisfactorily at 500° to 600° F. for limited periods of time.

The degree of heat stability possessed by silicone rubber can be illustrated by data obtained on air oven aging. Samples were exposed for 60 days at 390° F. At the end of this period, the samples had increased 10 points in Shore hardness and had 60% of their original tensile strength and 40% of their original elongation. A silicone rubber gasket had performed satisfactorily around the door of an oven operated continually at 480° F. for two years. Ducting made of silicone rubber and glass cloth is used to conduct air used to de-ice and heat aircraft. The air is at 500° to 700° F.

Silicone rubber spark plug caps are used to exclude moisture and dirt from the spark plugs of some modern automobile engines. The high temperatures encountered in this application caused organic rubber to fail in a short time. Silicone rubber-covered rolls are used in processing hot glass, metal and plastics. In use with plastics, the excellent release properties of the rubber are also utilized.

Low compression set at high temperatures is another outstanding characteristic of silicone rubber. A compression set of 10 to 15% after 22 hours at 300° F. is obtainable from some silicone rubber stocks. This property is of paramount importance in the large silicone rubber O-rings used as a cylinder liner seal on the engines of Diesel-electric locomotives. Low compression set is also necessary in the silicone rubber push rod seal which has been used for several years in Pratt and Whitney aircraft engines. These last two applications also require resistance to the effects of hot lubricating oil. The oil resistance of silicone rubber depends largely on the aromatic content of the oil. After 70 hours at 350° F. in ASTM No. 1 oil, a low aromatic oil, the swell is about 10%. Under the same conditions, ASTM No. 3 oil, a high aromatic oil, will cause a swell of approximately 50%.

In addition to high temperature stability, silicone rubber has low temperature flexibility superior to any other rubber. All silicone rubbers have brittle points of —80° F. or lower and remain flexible down to at least —50° F. Extreme low temperature types of silicone rubber have brittle points of at least —130° F. and are still flexible at —100° F. The amazing feature of this extreme low temperature flexibility is that the high temperature properties are not impaired. Temperatures as low as —100° F. have been encountered by military aircraft during high altitude flight. For this reason extreme temperature silicone rubber was chosen for the bomb bay door seal on the Convair B-36. It is also used in limit switch boots on the same airplane.

The electrical properties of silicone rubber compare favorably with those of electrical grades of rubber. Dielectric strength, power factor and dielectric constant are good at room temperature and remain relatively constant at temperatures up to 500° F. In addition, silicone rubber has arc resistance and corona resistance far superior to any organic rubber.

Because of these electrical properties, plus the long time heat stability and low temperature flexibility of silicone rubber, its use in many varied electrical applications has resulted. It is used to insulate ignition wire for aircraft and ordnance vehicles. Heating elements molded into sheets of silicone rubber are used for a number of aircraft applications. Silicone rubber tapes are used as outer wrapping for field coils, armature and transformer coils, and solenoids. These tapes vulcanize to form a resilient, void free, moistureproof and oil-resistant jacket. Besides having excellent dielectric properties, this silicone rubber jacket resists thermal and mechanical shock.

Resistance to the effects of outdoor weathering is a characteristic possessed by all silicone rubbers. Samples exposed for as long as four years on test racks in Florida have shown no appreciable change in properties. The test pieces showed no signs of checking or cracking although they were exposed both bent and stretched. This weather resistant property is utilized in many of the previously mentioned applications such as door seals and wire insulation.

Tubing and Calendering

By P. G. MAGNER, Jr.

General Tire & Rubber Co., Akron, Ohio

THIS discussion will be concerned primarily with general practices involved with the fabrication of silicone rubber extruded and molded parts. The first point that should be emphasized is the importance of cleanliness at every stage of silicone fabrication. The type of precautions which are required are not unusual to high quality production of rubber products; however, the degree of care which is required is probably seldom practiced except in very special cases. The reason for this exceptional care is a direct result of the type of service which is required of the majority of silicone products. Since they are usually required to operate at temperatures in the neighborhood of 400° to 500°F., and since such temperatures will cause decomposition of organic materials which might have contaminated the silicone, it is necessary that any such contamination be completely eliminated.

Typical sources of organic contamination are grease,

lint, wood splinters, brush fibers and rubber materials which are common in a rubber fabricating plant. Any such organic contamination will result in the appearance of dark brown areas or porosity, charred material, brittleness or rough extrusions. In most cases, the evidence of contamination will be recognized after the oven cure. The importance of careful handling of material and cleanliness is emphasized by the fact that silicone is basically an expensive material. This fact also is important as a consideration in the next point to be discussed.

Silicone reclaiming is profitable and successful as a result of a number of factors. The first of these, of course, is the fact that silicone as an expensive material will permit considerable reclaiming expense; the reclaim methods are simple, and the results are excellent. In general, the reclaim procedure involves several or all of a number of reclaiming steps: (1) Grinding cured rind and defective parts on two-roll rubber mill to approximately 1/16 to 1/8 inch mesh; (2) Treating with live steam for 4 to 8 hours at a temperature of 290° to 295° F; (3) Partial drying in a warm air oven; (4) Banding to form a homogeneous mass, and (5) Recompounding to give desired material.

The results of such reclaiming procedures can give equivalent or superior properties as compared to 100% new material. In one case in particular, a stock containing approximately 25% reclaim showed an increase in tensile of 15%, 10% increase in elongation and 1 point reduction in durometer hardness.

Molding and Curing

By J. E. MARTIN

Williams-Bowman Rubber Co., Cicero, Ill.

OUR company has had an active part in the manufacture of silicone parts since the very early days of silicone, and we are very proud of our accomplishments. There is nothing particularly different nor difficult in the fabrication of silicone parts for an experienced rubber fabricator. The processes are basically the same. Rather than show how much alike they are, I would like to point out the major differences, as follows:

Mold Design: Silicones shrink 4 to 5%, whereas other rubbers only shrink in the neighborhood of 1½%. For this reason, a mold cannot be used for both rubber and silicone, unless the part is very small or the tolerances will allow the dimensional variations. The general cavity design can be the same, except in places where there is an undercut, or the part has to be pressed through a hole, as is done in the manufacture of most grommets. Because of the low tensile and tear values of silicones, all mold edges must be rounded and oftentimes a split mold construction is necessary.

The silicones are less thermoplastic than other rubbers, that is, they do not soften as much when the temperature is raised to the curing temperature. For this reason they require higher mold pressures per square inch. Therefore, in order to obtain a thin flash, it is customary to make less cavities in molds designed for silicone. Silicones work well in either compression or transfer type molds.

Stock Preparation: Silicone must not be allowed to stand around too long after milling or extruding because of the tendency to set up. In some cases it is necessary to prepare stock twice in one shift in order to get the necessary flow in the mold. Because of the high cost of the raw material, stock preparation must be very accurate. It is often necessary to cut and weigh stock by hand. A light dusting with mica makes the tackier stocks easier to handle. The raw stock must be kept clean. Bits of rubber, paper, and other foreign matter turn to carbon in the oven recure and can often be the cause of rejections, which do not show up until the parts are finished.

Molding: The silicone compounds do not lend themselves to simple alterations, and difficulties in rubber molding that are often corrected by compound changes must be corrected in silicone molding by variations in molding techniques. This is accomplished by varying pressures and temperatures, bumping, and by varying the size and shape of the raw slug.

Trimming and Finishing: Dry ice tumbling is not very successful due to the low temperature resistance of most silicones. The trimming is usually done by hand, machine, or punch before oven recuring. Thin overflow must be removed from contact with the parts, or it will cure fast to the parts in the oven.

Oven Curing: It is usually necessary to supplement the press cure with an oven cure. Silicones hold their shape very well in the oven heat, and can be hung on rods or laid on perforated plates. The air in the oven must circulate freely in order to obtain a uniform cure. The oven should be vented to the atmosphere to remove objectionable smoke and gases.

As I stated in the beginning, and as this very brief resume indicates, there is very little difference between molding rubber and silicone. Actually, if you cover yourself in your cost for the special attention that silicone requires and deserves as a special high grade product, the silicones offer an interesting and profitable production.

QUESTIONS AND ANSWERS

Question—What is the process involved in bonding silicone rubber to itself and other surfaces?

Answered by Mr. Deasy: The bonding of silicone rubber to itself and other surfaces may be carried out easily, provided the surfaces are properly prepared. In general, the surface should be solvent cleaned and primed with a special silicone primer. If the bond is to be formed during the molding operation, only a primed surface is necessary to effect a bond; however, if cured silicone rubber is being bonded, a thin layer of a silicone adhesive must be used over the

primed surface to effect a bond. Heat and slight pressure are necessary to vulcanize the bond.

Question—Why are precise curing schedules necessary for silicone rubber?

Answered by Mr. Konkle: During the initial vulcanization of silicone rubber under heat and pressure, gaseous products are formed and entrapped in the piece. During the secondary air oven cure, these volatiles are driven off. It is necessary that the temperature of final cure is attained at a rate which will not cause the volatiles to escape so rapidly that porosity develops. Thus, a gradual rise in temperature, dependent on the thickness of the part and the specific compound involved, is necessary.

Question—What are the advantages of silicone as a mold release for rubber molding?

Answered by Mr. Magner: First, it is not decomposed by temperatures involved in curing rubber and therefore does not build up a film in the mold cavity. Second, it does not require an application at every cycle. Third, it does not stick to rubber.

LeTourneau Develops Rubber-Tired Railroad

TESTING and developing has been going on for several years at Longview, Texas, and now R. G. LeTourneau, Inc., has unveiled the "Tournatrain," a rubber-tired locomotive and freight car combination capable of economic operation over pathless desert sands or a cheaply constructed road through the Amazon or African jungle. The heart of the Tournatrain is the "electric wheel," which carries a large pneumatic tire and has within its rim an electric motor and gear reduction. These electric wheels are being built in different sizes to take tires from 5 to 10 feet in diameter.

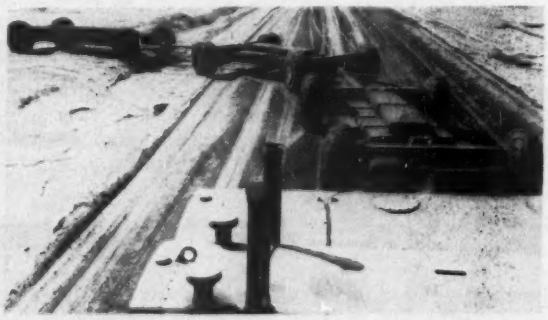
Every wheel of the Tournatrain is a rubber-tired, self propelled electric wheel. The electric wheels derive their energy from the locomotive which mounts diesel engine driven electric generators. The Tournatrain engineer, from his cab on the locomotive, applies power at will to all wheels of the Tournatrain. In this way each freight car provides propulsion for its own load—each car of the Tournatrain pushes and pulls at the same time. There are no brake shoes to wear out because the same electricity that drives the wheel can be used to hold it back going down hill. Only an automatic spring loaded brake is provided for emergency.

Each car is coupled to the car ahead of it in such a way that it follows in the same tracks. By a simple automatic steering device the path of the locomotive is duplicated in its turn by each car of the train so that the locomotive can pull up to a street intersection and make a right angle turn and every car will come up to the same spot and make the same turn. With this combination-electric self propulsion in every wheel—large diameter and wide base tires providing flotation over sand and bag—each car tracking the one in front of it—all these are said to make it economical for today's transportation planners to pay as they go. While the Tournatrain will run faster on a good road than on a bad one, it will operate on a mere bulldozer trail at slow speed to get products to the market—later, according to "what the traffic will bear," the road can be improved and the same train will operate faster and at lowered costs.

The Tournatrain will not supplant the railroad train as we know it today in industrial areas, the company states. Standard railroads, with their right of ways and rails already paid for, will continue to be a low-cost medium of transportation in highly developed and industrialized countries. The Tournatrain, on the other hand, may well become the trail blazer for cargo transportation in undeveloped areas. If it were allowed on city streets, it could drop a carload of coal or cement right at the consumer's door. The wear on pavement would be less than ordinary trucks because the tires carry lower pressures; therefore the pressure per square foot of pavement is much less.

The Tournatrain locomotive does not pull the cars as an ordinary diesel electric railroad train. Every car of the Tournatrain pulls itself. The locomotive just supplies electricity and leads the way. The ordinary train requires that the grades be nearly level on account of the traction, while the Tournatrain can climb a steeper grade than an automobile, so that tunneling a mountain or zigzagging up its sides will not be necessary.

This photograph shows a typical "Tournatrain" with eight 20-ton capacity freight cars. The men and the automobiles in the picture serve as a contrast to the size of the locomotive.



Shown above are the freight cars of the self-propelled "Tournatrain" in the path of the locomotive. Every wheel of the unit is a rubber-tired self-propelled electric wheel.

Editorials . . . . . .

Window Dressing?

ALTHOUGH the members of the three-man Disposal Commission provided by the Rubber Producing Facilities Disposal Act of 1953 have not yet been named and although the law provides that any disposal plan conceived by the Disposal Commission need not be submitted to Congress until January 31, 1955, there are already rumblings in Washington to the effect that the Disposal Act was merely "window dressing" and that a group of senators (presumably all Democrats) has no intention of letting the synthetic rubber production facilities fall into private hands. These rumblings have a most unpleasant connotation.

As indicated in these columns recently, there is a strong possibility that the disposal of these government-owned facilities may become a political football, and the eventual decision may be based purely on log-rolling rather than on merit. An indication of this was given when the Senate Banking and Currency Committee voted out the Disposal Bill by a vote of 8 to 6, with all the Republicans voting for the bill and all the Democrats against it. This was more than mere coincidence and certainly casts a shadow for the future. It hardly speaks well for American unity if the august Senate body stoops so low as to permit partisan politics to determine a decision of major importance to American industry and the American people at large.

Above and beyond all the good and valid reasons for disposal to private industry, many of which have previously been treated in these columns, there is the attitude of the natural rubber-producing countries to be considered. There is a growing bitterness in Southeast Asia with respect to the continued monopoly of synthetic rubber on the part of the United States Government. Producers of natural rubber are not afraid of synthetic rubber competition, but they seek such competition on even terms. This is still another reason why disposal of the synthetic rubber facilities to private industry is a must.

Tire Costs

EVERY rubber manufacturer is naturally cost-conscious, and this feeling is of course shared by the tire producer. It has long been felt that the major tire producers went after the original equipment business because the volume enjoyed would help reduce the specific cost of all tires manufactured in any definite period. Despite the most careful accounting methods employed, it is extremely difficult to determine the exact cost of a single tire, and therefore some figures recently produced by the American Economic Foundation should prove of interest.

In analyzing the financial statements of the "Big Four" covering the calendar year of 1952, the American Economic Foundation came to the conclusion that it cost 96.4 cents out of every dollar received to build and sell a tire. Of this figure 55.7 cents represented materials, 27 cents labor, 11.7 cents taxes, and 2 cents depreciation. The Foundation, incidentally, has a quaint method of defining some of these costs. For example, labor costs are termed "cost of human energy, pay rolls, pensions, etc.," taxes represent "cost of payments ordered by the government," and depreciation is called "the cost of tools wearing out."

Further analysis indicated that out of the 3.6 cents left from every dollar, 1.6 cents was paid to the stockholders as dividends and the other 2 cents was reinvested in the business. The 3.6 cent profit, incidentally, is referred to as "the cost of using the tools." Dividends, according to the analysis, amounted to 3.1 percent return on the investment and, at this rate, profits in the 1952 period were equal to about a 6.5 percent return on total investment. This is far from a world-shattering figure for investment return, but compares very favorably with that of other major industries. The Foundation's analysis covered the reports of all four companies and represents an average. However, the individual figures continue to show that the B. F. Goodrich Co. is the star performer on investment return.

NEWS OF THE MONTH

RFC MAY CUT FOURTH QUARTER GR-S OUTPUT; CONSIDERS POSSIBLE INCREASE IN GR-S PRICE

ACCORDING to recent reports, the Reconstruction Finance Corporation may cut back the fourth quarter production of synthetic rubber 20% or more in line with anticipated lower demand for the material. A cut of this size would bring total production for the fourth quarter of 1953 to less than 120,000 long tons from the approximate 160,000 long tons which will be produced in the third quarter. RFC is also laying the groundwork for a possible increase in the price of GR-S. Administrator Kenton R. Cravens revealed on September 3 that the agency is "rebudgeting" its synthetic rubber operation for the current fiscal year, quarter by quarter, on the basis of decisions to cut back production. Previously, on August 20, RFC announced it would shut down the GR-S plant at Institute, West Va., operated for the government by the B. F. Goodrich Chemical Co. This plant will be shut down on September 19 for an indefinite period. It is geared to produce 90,000 tons of GR-S annually.

Several reasons are advanced for the reduction in output, chief of which is the fact that tire stocks in manufacturers' hands have been climbing at an alarming pace. This is contrary to the seasonal trend when the tire business is usually enjoying prosperity. As of the end of June, there were more than 16,000,000 tires in manufacturers' hands, over 40% more than at the same time in 1952, and the highest total in 24 years. Another reason, though less important, is the fact that tire making is normally at the slowest season of the year in the late months.

A third reason which is said to have a bearing on RFC thinking is the fact that the price of natural rubber has declined in recent months to less than the 23c a pound, plus 1c freight, for GR-S. The effects of this drop in the price of natural rubber have already showed up slightly in the greater use of natural during July. This increase is expected to continue on a limited scale for succeeding months, cutting into the use of synthetic rubber.

Large RFC Inventory

Aside from the diminished demand, a production cutback is indicated by the current large inventory of GR-S held by RFC. The agency expects that at the end of September, stocks will total 80,000 long tons, only 5,000 tons less than the maximum it is permitted by the Bureau of the Budget to have on hand as of June 30, 1954.

Still another factor which has influenced rubber consumption is the recent fire at the transmission plant operated by the General Motors Corp. at Livonia, Mich. This fire has slowed production of three GMC divisions as well as several independents.

Many rubber companies have already cut back the output of original equipment tires, one company to the extent of 5,000 fewer tires a day. Firms which have not cut back are putting their original equipment tires that would normally go to GMC into inventory, thereby swelling these stocks even more.

Despite the several good reasons for a cut in production, one industry official in Akron cautions that the entire situation could turnabout between now and November 1. He recalled that RFC just a year ago decided to reduce production of GR-S in anticipation of lower demand, only to reverse itself and attempt to boost output before the final quarter had progressed too far.

This official thinks that the price of natural rubber could return to the 27-28c a pound level of last May, and tire manufacturers would return to greater use of synthetic. He also believes that opinions as to how soon GMC can get back into full production are too pessimistic and the company may be needing all the tires it can get by the end of September.

As to RFC's rebudgeting of its synthetic rubber operations, Mr. Cravens said that the job is being done with "meticulous care," and completion of the task may be some time off. Early in July, RFC, seeing that the synthetic plants were setting new production records, anticipated a net profit of $70,000,000. A cutback will require a trimming down of output all along the line and could raise unit costs substantially.

The rubber plants cannot lay off too many workers because a large portion are required for maintenance purposes, irrespective of whether the plant is producing at or well below capacity. Labor is said to be the major cost element, and a relatively inflexible one, in the production of synthetic rubber.

It has been unofficially estimated that copolymer plants stop making money at the 23c a pound sales price when production dips below 70% of capacity. If fourth quarter production is slashed in the anticipated amounts, the plants will be operating at about 75% of capacity.

Asks Firm Advance Orders

Mr. Cravens also dropped a hint of a possible price rise for GR-S in his recent proposal that purchasers of dry GR-S place firm advance orders covering a three-month supply. The draft of that proposal, designed to take effect with October deliveries, offered price protection to RFC customers.

As for the proposal itself, Mr. Cravens said it is still under consideration and conceded it could not be put into effect in time for October deliveries. If it is put into effect for November deliveries, it would work in this manner:

Purchasers of more than 750,000 pounds a quarter would be required to submit firm orders by October 10 covering requirements for November, December and January. This would be repeated each month with November 10 orders covering December, January and February deliveries. Were RFC to raise the price of GR-S, say on October 11, purchasers would not have to pay the higher price on rubber received before February 1.

Purchasers of less than 750,000 pounds a quarter, under the RFC proposal, would have the option of continuing to place orders on a 30-day price basis, but without price protection. Or they could go on the three-month advance order basis, with price protection. The only inducement to elect the longer-term advanced order basis is price protection.

State Officials Complain

The RFC decision to close the synthetic rubber plant at Institute, West Va., has evoked strong criticisms from state and local officials. Governor Marland, in a telegram to Mr. Cravens, termed "discriminatory and an injustice" any action requiring the Institute plant to bear more

than its proportionate share of a cutback in the government's synthetic rubber program.

The Charleston, West Va., Chamber of Commerce sent letters to Senators Kilgore and Neely and Representative Robert C. Byrd, calling for their "immediate and aggressive assistance" in seeing that the order is rescinded or modified.

That the government's actions with respect to synthetic rubber are not only the concern of the citizens of West Virginia but of the world, was apparent in a recent statement by Sir Sydney Palmer, a leading spokesman for rubber producers in Southeast Asia. Sir Sydney, a former chairman of the British Rubber Development Board, made a plea for an increase in the price of GR-S in the United States. He told a press conference that his hope was to raise the price of natural rubber and with it the income of 500,000 smallholders in Malaya.

At a press conference in Washington, D. C., arranged by the Natural Rubber Bureau, Sir Sydney said that he expects the price of synthetic rubber will go up 3 or 4c a pound when the government-owned plants are sold to private industry, but noted that this would not be for about twenty months. If the price of synthetic goes to 26 or 27c a pound, he said, "we can continue to operate, but not at any extravagant profit." He estimated production costs in Malaya at about 25c a pound.

Sir Sydney also said he had heard "reports" that the Russians are negotiating with Indonesia for natural rubber, which is considered a strategic commodity in the Western bloc's system of trade restrictions against Iron Curtain countries. Ceylon recently negotiated a swap of 50,000 tons of rubber with Communist China in return for rice.

In another recent press conference, Joseph H. Rogatnick, U. S. Counsel at Singapore, stated that supply and demand in the free world's rubber market are now approaching equilibrium after a period of modest surpluses. He said that the long-range outlook for world rubber demand is good. Rubber consumption, both natural and synthetic, is expected to total about 2,500,000 metric tons in 1953, he said, and by 1960 may climb to 3,000,000 tons.

Surpluses, largely the result of a tapering off of stockpile buying and the continuation of high production rates, are now declining, he said. At mid-year there was a rubber surplus of about 100,000 tons. By year end, he predicted, the total should drop to about 50,000 tons.

Asks Curbs on Excise Taxes

Other news of interest to the rubber industry came from the National Association of Independent Tire Dealers which has asked the House Ways and Means Committee to remove the excise tax on tires and tubes because these products are "an everyday necessity. If Congress will not cancel the tax, it should reduce the discriminatory rates which put thousands of independent and small businessmen at a competitive disadvantage," the association declared.

W. W. Marsh, executive secretary of the organization, explained that dealers must pay the tax to their suppliers when a shipment is delivered. "As a result, they have approximately 10% of their working capital tied up in taxes," he said. The committee is currently studying revisions of the tax laws.

Several times in the last few years the Rubber Manufacturers Association has called on Congress to either reduce the tax or eliminate it entirely. The levy was first imposed about 20 years ago as a means of obtaining additional revenue. Manufacturers collect the tax on every tire and tube they sell to a distributor or dealer. The latter, in turn, collect the tax from the customer. The federal tax on a 6.70 x 15 casing, for example, is $1.15.

Malaya to Get More Aid

According to a recent announcement, the British government will give new financial assistance to the Federation of Malaya to help meet the costs of combating the Malayan Communist insurrection. The amount will be worked out in consultation between the Federation and London. Malaya has spent approximately $250,000,000 during the last five years in fighting the Communist guerrillas. The British government has contributed about the same amount through various forms of aid. State governments in Malaya have also spent large sums. Malaya this year faces a budget deficit of about $70,000,000. This can be met by proceeds of a state loan and from a Treasury surplus, but the means are lacking domestically to meet a similar deficit anticipated for 1954.

Intercontinental Plans Merger

Stockholders of the Intercontinental Rubber Co. will vote at a special meeting to be held in New York on September 24 on a proposal to merge the company with Texas Instruments, Inc. of Dallas, Texas. The merger plan calls for the stockholders receiving one share of stock of the merged company for each of the 595,832 shares of Intercontinental stock outstanding. The balance of about 2,400,000 shares of the merged company would go to shareholders of Texas Instruments. Shareholders of Texas Instruments will meet in Dallas, Texas, on September 25 to consider the proposal. Texas Instruments, which produces electronic and electro-mechanical equipment, plans to arrange in advance of the proposed merger to have the shares of the surviving company listed on the New York Stock Exchange. A pro-forma balance sheet of the projected company, to be known as Texas Instruments, Inc., indicates that it will gain $1,429,615 in current assets and $1,799,647 in total assets through the merger. In a financial report covering the five months to May 31, 1953, Intercontinental showed a net loss of $92,701 on sales of $78,115.

FIRESTONE SIGNS NEW CONTRACT PROVIDING 12c HOURLY PACKAGE

A strike of 25,500 Firestone Tire & Rubber Co. employees begun on August 26, ended on August 30, in an agreement providing a 12c hourly pay raise package, including a 5c general increase. L. S. Buckmaster, president of the United Rubber Workers, C.I.O., said the workers were told to go back to their jobs as soon as the company production schedules were posted at plants in eight cities affected.

In addition to the 5c general increase, which raised the production and maintenance worker's average hourly pay to $2.10, the settlement provides for a $25 increase in pension payments and comprehensive hospital and surgical insurance for employees and their dependents at company expense. The agreement is effective October 1, and the life of the present contract was extended one month to July 10, 1954. Pay boosts are retroactive to August 24.

Mr. Buckmaster termed the strike, first at Firestone since 1937 "regretable, but necessary" and added "it was the only manner in which we could reach a satisfactory settlement."

The company's negotiators, headed by R. M. Stacy, assistant industrial relations director, and the U.R.W. bargainers, led by international representative George Bass, had been negotiating in Cleveland, Ohio, since the walkout started. The package settlement, which the union said was "worth more than 12c an hour," provides for interplant wage adjustments benefitting plants in Fall River, Mass. and in New Castle and Noblesville, Ind. The other Firestone plants affected are the main one at Akron, Ohio, employing about 10,000 and plants in Los Angeles, Des Moines, Memphis and Pottstown, Penna.

Under the pension revision, employees who retire at 65 after 25 years' service will draw $125 instead of $100. This will apply to all workers who have retired since June 5, 1950, when the five-year pension and insurance pact first was signed.

Of the other members of the "big four," the B. F. Goodrich Co. concluded contract negotiations with the U.R.W. on September 1 under terms similar to those agreed to by Firestone. While the pay rise granted Firestone employees brought average hourly wages to $2.10, the Goodrich settlement brought average hourly wages to $2.09.

Wage agreements with the Goodyear Tire & Rubber Co. and the U. S. Rubber Co. have been terminated by the U.R.W. effective September 8. Union officials moved immediately to consideration of the negotiations, which have been in progress with the two companies.

Other labor news came on August 9, when two major unions, the U.R.W. and the International Association of Machinists, A.F.L., announced a "no-raiding" agreement in which each pledged to respect areas organized by the other. The agreement follows in form one worked out tentatively by the A.F.L. and C.I.O. Leaders of the two organizations have said that raids are costly to union treasuries.

GOODRICH EXECUTIVE REPORTS ON TUBELESS TIRE PRODUCTION

Production of tubeless tires is currently at an all-time high, according to William S. Richardson, executive vice-president of the B. F. Goodrich Co. "More than two million tubeless tires have already been delivered to American motorists, and the present rate of tubeless tire production in our plants is double that of last year. The new tires are now on more than half a million cars and the number is increasing daily," Mr. Richardson said.

Mr. Richardson noted, too, that the tubeless tire has made the greatest sales gains of any tire on the replacement market. He said that while unit sales of all makes of passenger car tires increased 34% in 1952, tubeless tires gained 90%. He credited the popular acceptance of tubeless tires to the "new standards of safety, service and mileage the new tire has established." He said that tubeless tires have carried Americans over 12 billion blowout-protected car miles since their introduction in 1947.

Reviewing the rubber company's continuing program of research and development on tubeless tires, Mr. Richardson said that the tubeless principle has now been applied to aircraft tires. A new Goodrich tire, the world's first high pressure tubeless tire, is currently in use on the Navy's swept wing jet fighter, the Panther, Mr. Richardson said.

Outlining additional markets for tubeless tires, Mr. Richardson said that a low price version of the firm's original passenger car tubeless tire is now on sale throughout the state of Texas. Called "Safetyliner," the new tire eliminates all the disadvantages of inner tubes while retaining many of the safety features of the Goodrich "Life-Saver" tubeless tire. The new tire does not have the puncture-sealing construction or the grip-block tread of the Life-Saver, however.

Mr. Richardson said that tubeless tires are already in use on certain farm implements and revealed that it is expected that the advantages of the new tires will be extended to all tire users in the near future.

Circle Wire Building Program

Circle Wire and Cable Co. has announced that ground is being broken for the construction of a new $1,000,000 building on property east of the main plant in Maspeth, N. Y. The building will cover 159,000 square feet of floor space and will provide new administrative offices, laboratories and engineering quarters in addition to increased warehouse space. To facilitate shipment of the company's products a new railroad siding connecting with the Long Island Railroad will be built on the property.

Named Flintkote Research Head

R. H. Cubberley has been appointed director of research for all divisions of the Flintkote Co. Mr. Cubberley will be located at the company's research laboratory at Whippany, N. J.

Old Conveyor Belt Retired

A grain conveyor belt with the longest known record of service for an industrial rubber belt has finally been retired after 64 years of continuous use by a Minnesota grain concern. Made by the New York Belting and Packing Co. of Passaic, N. J., in 1889, it was one of the first cotton duck and rubber belts to be used for industrial hauling. The 24-inch wide belt will be sent back to the Passaic plant of New York Belting to undergo extensive laboratory tests. Officials of the grain company elected to replace the belt when major construction changes were being made in one of their elevators. Though the belt apparently had several years of useful service left, the officials decided it was time to change belts according to a spokesman for the W. S. Nott Co., Minneapolis distributors for New York Belting. The Nott company had originally sold the belt to the grain concern.

Gro-Cord Acquires Alfred Hale

Gro-Cord Rubber Co. of Lima, Ohio, has announced the acquisition of the Alfred Hale Rubber Co. of North Quincy, Mass. The Hale company, established in 1837, is one of America's oldest manufacturers of soling material for the shoe industry. Forest Moor, president of Gro-Cord Rubber, said that the Alfred Hale quality product line will be maintained and that the range of materials will be expanded at an early date. Gro-Cord will make full use of Alfred Hale personnel and factory facilities. New officers of the Alfred Hale Rubber Co. are: Fred W. Cook, chairman of the board; Forest Moor, president; Harold Smith, vice-president; David R. Cutler, vice-president; John S. McKindsey, vice-president and sales manager; Winston L. Hunt, secretary-treasurer; Albert Hocknell, assistant treasurer; Melvin C. Light, assistant secretary.

Astin Reinstated as NBS Chief

Dr. Allen V. Astin has resumed permanent directorship of the National Bureau of Standards under new reforms stripping him of some of his former powers. In a complete about-face, Commerce Secretary Sinclair Weeks announced that he had dropped his plan to fire Dr. Astin "because I am convinced that it is in the best interests of the Bureau and the public." Secretary Weeks forced Dr. Astin's resignation last spring in a row over the battery additive, "AD-X2," but later reinstated him temporarily after scientific groups raised a storm of protest. Secretary Weeks also announced that he was assuming personal responsibility for non-technical aspects of tests on commercial products. In the future, he said, the Bureau director's responsibility would be "limited to the technical area."

COLLYER PREDICTS CONSUMPTION WILL SET NEW RECORD IN 1954

John L. Collyer, president of the B. F. Goodrich Co., said recently that current Goodrich estimates indicate that the United States will consume more new rubber this year than ever before and that sales of all types of pneumatic tires will be the second highest in history.

Mr. Collyer estimated that total consumption of new rubber in the United States in 1953 will total about 1,375,000 long tons. Synthetic rubber which constituted 64% of the 1952 total is currently about 56%.

Sales of passenger car, truck, bus, farm, airplane and industrial tires may be as high as 102,000,000 units this year, a volume surpassed only by 1950's record 106,000,000, Mr. Collyer said. He stated that while tire sales during the last half of 1953 will reflect seasonal declines normally experienced they also probably will be the second highest in industry history, again exceeded only by the sales volume in the last half of 1950.

Mr. Collyer said that the industry's stocks of tires declined more than 1,200,000 units in July and he said indications are that another substantial decrease occurred in August. He explained that industry inventories are usually built to an annual peak at the end of each June in order to meet the heavy demands for tires during the heavy summer selling season.

Philadelphia Holds Outing

The Philadelphia Rubber Group held its Ninth Annual Outing on August 21 at the Cedarbrook Country Club, Mount Airy, Philadelphia, Penna. Perfect weather brought out 229 members, the largest attendance in the history of the group. John Baymiller (Armstrong Cork) and Ed Osborne (Goodrich Chemical), scored 78's to win the golfing tournament. A. J. DiMaggio (Firestone) served as chairman of the Outing Committee. Lindsay Shaw (Goodrich) and Tom Elkin (Vanderbilt) headed the Prize Committee. M. A. Youker (DuPont) was chairman of the Donations Committee. The day's activities included a dinner which was preceded by a cocktail hour. Each member of the Philadelphia Group in attendance received a door prize.

ASTM 56th Annual Meeting

The 56th Annual Meeting of the American Society for Testing Materials was held on June 28 to July 3, 1953 at the Chalfonte-Haddon Hall Hotel in Atlantic City, N. J. The meeting featured 34 technical sessions at which 131 technical papers were presented. Registered attendance for the meeting was 2,472. Committee D-11 on Rubber and Rubberlike Materials met on July 3 at which time action was taken on the adoption of some new standards, the acceptance of some tentative standards and the revision of some other tentative standards. A full report of the 56th Annual Meeting will appear in a future issue of RUBBER AGE.

ASME RUBBER DIVISION PLANS PROGRAM FOR NEW YORK MEETING

The Rubber and Plastics Division of the American Society of Mechanical Engineers has announced its final program for the meeting scheduled to be held on November 30 and December 1 at the Hotel Statler in New York, N. Y. At the morning session on Monday morning, November 30, S. W. McCune, III (DuPont) will act as chairman, while James B. Johnson (Linear) will act as vice-chairman. Three interesting papers have been planned for this session, as follows:

"Synthetic Rubber Protects the Navy's Propeller Shafts," by E. A. Bukzin, Bureau of Ships, Department of the Navy, Washington 25, D. C.

"Hot Stretching of Nylon Tire Cord," by C. A. Litzler, C. A. Litzler Co., Inc., 11621 Detroit Ave., Cleveland 2, Ohio.

"Modern Rubber Calendering Equipment," by N. J. Elder, Calender Division, Adamson-United Co., Akron 4, Ohio.

The afternoon session on November 30 will have P. D. Brass (U. S. Rubber) as chairman, and H. W. Greenup (Pilgrim Latex Thread) as vice-chairman. For this session, four papers have been planned, as follows:

"Dynamic Characteristics of Silicone Rubber," by G. W. Painter, Lord Manufacturing Co., Erie, Penna.

"Mechanical Properties of Polysulfide Rubbers," by Joseph S. Jorczak, Technical Service Department, Thiokol Corp., 780 N. Clinton Ave., Trenton 7, N. J.

"The Versatility of Cellular Rubber in Engineering," by George R. Sprague, Arthur F. Sereque, John J. Corrigan and John L. Gretz, Sponge Rubber Products Co., Shelton, Conn

"Selected Rubber References for the Mechanical Engineer: July, 1952-June, 1953," by Leora Straka, Goodyear Tire & Rubber Co., Akron, Ohio, and Betty Jo Clinebell, Rubber Library, University of Akron, Akron, Ohio.

On Tuesday morning, December 1, there will be a joint session with the Machine Design Division. Professor R. K. Witt (Johns Hopkins) will act as chairman for this session, and A. C. Webber (DuPont) will serve as vice-chairman. Three papers have been scheduled for this session with one of the three to be supplied by the Machine Design Division. The other two papers are:

"Viscosity of Polymethyl Methacrylate: An Experimental and Analytical Study," by James K. Knowles, Department of Mathematics, Massachusetts Institute of Technology, Cambridge, Mass., and Dr. G. H. Dietz of the Plastics Research Laboratory of M.I.T.

"Reinforced Plastic Laminates for Aircraft Use," by D. Rosato, Materials Laboratory, Wright Air Development Center, Wright-Patterson Air Force Base, Dayton, Ohio.

The afternoon session on December 1 will have C. H. Adams (Monsanto) as chairman, while Norman A. Skow (Synthane) will serve as vice-chairman. For this session, three papers have been scheduled, as follows:

"Speedylectric; the Electrode Boiler—A New Method of Supplying Heat to Calenders and Platens," by Bradley C. Higgins, Livingstone Engineering Co., Worcester, Mass.

"New Developments in Liquid Heating of Plastics Processing Machinery," by Paul L. Geiringer, American Hydrotherm Corp., Long Island City, N. Y.

"Selected Plastics Literature References for the Mechanical Engineer—July, 1952-June, 1953," by Dr. Paul O. Powers, F. W. Elliott, J. K. Stevenson, K. E. Jackson, and J. R. Kelly, Pennsylvania Industrial Chemical Corp., Clairton, Penna.

LOGES AND TRUE APPOINTED TO SALES STAFF OF BINNEY & SMITH CO.

Richard L. Loges — **Thomas P. True**

Binney & Smith Co. has announced the appointment of Richard L. Loges and Thomas P. True to its sales staff. Mr. Loges has been attached to the Akron office of the company and will handle all company products used in the rubber, paint and ink fields. He is a recent graduate of the University of Indiana and just completed a tour of duty with the U. S. Marine Corps. Mr. Loges was formerly associated with Sherwin-Williams, also in a sales capacity. Mr. True joined the company in June of this year after completion of his military service. He was graduated from Yale University in 1950. Mr. True will cover northern New Jersey from the New York office for all company lines for the rubber, paint and ink industries.

Cincinnati Belt System Proposed

A proposal to construct a two-way passenger conveyor belt system to service an 80-block business area in the heart of Cincinnati, Ohio, has been made by the Goodyear Tire & Rubber Co. and the Stephens-Adamson Manufacturing Co. The proposed belt line is similar to one suggested for use as a shuttle between Times Square and Grand Central in New York City. For Cincinnati, the two companies are proposing to build a two-way subway system covering 7,200 feet in each direction in the form of a rectangle, six blocks long and three blocks wide. It is estimated that the use of this system with six loading and unloading terminals would eliminate need for bus operation in the congested downtown area and would decrease on-street parking in the business area.

Oakite Management Changes

Following a recent meeting of the board of directors of Oakite Products, Inc., New York, N. Y., three changes in the management organization were announced. J. J. Basch, former Philadelphia division manager and veteran of 28 years service with the company, was appointed manager of research and product development. He will be in charge of the company's expanding technical research program, and will supervise the field testing of new and experimental materials. A member of the company's board of directors since 1948, he has also been elected a member of its Executive Committee. At the same meeting, E. H. Steif, general attorney of the company and member of the Oakite organization since 1948, was appointed assistant secretary and elected to the board of directors. Another appointment announced was that of W. A. Baltzell, former southern division manager and with the company since 1941, as assistant sales manager. He will assist the general sales manager of the company's industrial division in connection with sales management functions. The new appointments, a company spokesman states, are designed to add to the managing and operating strength of the company, and to assist it in meeting with maximum effectiveness the increasing demands made upon its facilities by all branches of industry.

Battelle Adding New Laboratory

Construction has begun on a new laboratory building to house chemical research at the Battelle Memorial Institute, Columbus, Ohio. Workmen are now preparing the foundation for the new structure to be built at an estimated cost of $1,400,000. In announcing construction plans, officials of the Institute said that the new building will provide 100,000 square feet of additional laboratory space to help meet the continuing space requirements of research for both industry and government. Battelle has conducted an almost continuous building program since 1935. Indicative of the research center's growth is its increase in personnel. The present staff of 2100 is more than double that employed at the close of World War II. The new building—Battelle's seventh major structure in Columbus—is slated for completion in the fall of 1954. The four-story brick and concrete structure will have outside dimensions of 63 by 290 feet. Plans include provision for space for pilot plants used in chemical engineering research.

Pittsburgh Diffraction Conference

The Eleventh Annual Pittsburgh Diffraction Conference will be held at Mellon Institute, Pittsburgh, Penna., on November 5 and 6, 1953. Technical sessions are being arranged for "Instrumentation and Methods," "Metals," "Recrystallization and Preferred Orientation," and "Structure of Polymers." Papers on general diffraction subjects will also be accepted. Contributed papers will be considered in the order in which they are received. Titles should be submitted to the program chairman, E. E. Wicker, Research and Development Laboratory, U. S. Steel Corp., 234 Atwood St., Pittsburgh 13, Penna., before September 1, 1953. Abstracts should be submitted by September 21. Additional information and a copy of the preliminary program, when available, can be obtained from Dr. H. R. Letner, Mellon Institute, Pittsburgh 13, Penna.

PAAA Schedules Meeting

Four major users of premiums to stimulate sales will be speakers at the Premium Advertising Association of America's semi-annual conference to be held in conjunction with the PAAA-sponsored New York Premium Show at the Hotel Astor in New York City on September 22. The theme of the conference is "Using Premiums to Meet Marketing's Greatest Challenge." L. R. Bressler, vice-president of Stanley Home Products, Inc., will discuss "Premiums in Direct Selling." Donald R. Grimes, president of the Independent Grocers' Alliance, will talk on "Premiums in the Food Field," while "Premiums in the Appliance Industry" will be discussed by Seymour Mintz, vice-president of the Admiral Corp. Joseph A. Moran, vice-president of Young & Rubicam, Inc., will cover developments in "The Premium Offer via Radio and TV."

Coming Events in the Rubber Industry

Oct. 1. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Oct. 2. Detroit Rubber and Plastics Group, Fall Meeting, Detroit-Leland Hotel, Detroit, Mich.

Oct. 3. Connecticut Rubber Group, Annual Outing, Patterson Country Club, Fairfield, Conn.

Oct. 6. Buffalo Rubber Group, Hotel Westbrook, Buffalo, N. Y.

Oct. 6. Los Angeles Rubber Group, Hotel Statler, Los Angeles, Calif.

Oct. 8. No. California Rubber Group, Elks Club, Berkeley, Calif.

Oct. 16. Boston Rubber Group, Fall Meeting, Hotel Somerset, Boston, Mass.

Oct. 16. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Oct. 21. Washington Rubber Group, Washington, D. C.

Oct. 23. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Nov. 6. Chicago Rubber Group, Fall Meeting, Furniture Mart, Chicago, Ill.

Nov. 10. Los Angeles Rubber Group, Hotel Statler, Los Angeles, Calif.

Nov. 13. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Nov. 18. Washington Rubber Group, Washington, D. C.

Nov. 19. Rhode Island Rubber Club, Metocomet Golf Club, East Providence, R. I.

Nov. 29-Dec. 4. A. S. M. E. Annual Meeting, Hotels McAlpin and Statler, New York, N. Y.

Dec. 3. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Dec. 3-4. Society of the Plastics Industry, Fifth Film, Sheeting and Coated Fabrics Division Conference, Commodore Hotel, New York, N. Y.

Dec. 11 Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 11. Detroit Rubber and Plastics Group, Xmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 11. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 12. So. Ohio Rubber Group, Xmas Party, Miami Valley Country Club, Dayton, Ohio.

Dec. 15. Buffalo Rubber Group, Xmas Party.

Dec. 18. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Jan. 24, 1954. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Jan. 27-29, 1954. Society of Plastics Engineers, Inc., Tenth Annual National Technical Conference, Royal York Hotel, Toronto, Ont., Canada.

Jan. 29, 1954. Akron Rubber Group, Winter Meeting, Mayflower Hotel, Akron, Ohio.

Feb. 5, 1954. Chicago Rubber Group, Congress Hotel, Chicago, Ill.

Feb. 11, 1954. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Mar. 26, 1954. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

Mar. 26, 1954. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Apr. 2, 1954. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Apr. 14-16, 1954. Rubber Division, A.C.S., Spring Meeting, Hotel Brown, Louisville, Ky.

Apr. 30, 1954. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

June 18, 1954. Akron Rubber Group, Summer Outing.

June 22-25, 1954. Institution of the Rubber Industry, Third Rubber Technology Conference, London, England.

Sept. 15-17, 1954. Rubber Division, A.C.S., Fall Meeting, Hotel Commodore, New York, N. Y.

NEW YORK GROUP HOLDS ANNUAL GOLF TOURNAMENT ON AUGUST 4

Members and guests of the New York Rubber Group participated in the annual golf tournament which was held this year on August 4 at the Baltusrol Golf Club in Springfield, N. J. C. O. Davidson (Binney & Smith) served as chairman of the Golf Committee, while T. F. Callahan (Witco) was treasurer. Other committee members included G. H. Provost (U. S. Rubber) and A. H. Eufer (R. T. Vanderbilt).

Golfing activities were started at 9:30 A. M. Lunch was served from 12:00 to 2:00 P. M., and dinner was served at 7:30 P. M. Door prizes were distributed to holders of lucky numbered tickets. Golfing event prizes were won by the following:

Low Gross, E. B. Curtis, V. Lake, F. Salamon, J. Howath, J. C. Vincent and S. Woznak; *High Gross*, S. R. Dover; *Putting*, G. Sprague, J. Schreiber, M. F. Stiles, R. G. Newburg, *Kickers' Handicap*, Messrs. Partington, Weling, D. Jones, Bruce, Pechal, Norden, Dugan and Fairchild; *Birdies*, Messrs. Curtis, Wehner, McCollum, Fairchild, Hubbard, Gerold, Salamon, Kimeon, Hicks, Day, Vincent, Schreiber, Hackley, Hunt, T. Jones, and Blasius.

Shown above are members and guests of the New York Rubber Group on the links and in the clubhouse of the Baltusrol Golf Club, Springfield, N. J., site of the golf tournament held on August 4. Photos by courtesy of Jesse Young (Advance Solvents).

Fisk Transportation Truck Tire

A new highway truck tire that is said to give as much as 41% more original tread miles over previous types, has been announced by the Fisk Division of the U. S. Rubber Co. The new tire has variable grooves and ribs to give maximum stability and wear, and comes in sizes ranging from 6.00-16 to 11.00-24. Called the "Fisk Transportation," the tire features an "angle action" tread, with more than 33,000 biting edges in the larger sizes. The deep grooves in the tread are relatively narrow on the diagonal to give good surface contact, but straight ahead grooves are wider for strength where there is the greatest strain. Another feature of the tire is its load molded contour, which means that its inflated shape is the same as when the tire leaves the mold. Most tires are under constant strain from the time they are first inflated, but with this tire the strain is tremendously reduced because of the pre-shaping. Weather "checking," aging, and surface deterioration of sidewalls are virtually eliminated in the new tire, the company stated. With a super adhesive cord treatment, there is a 50% stronger weld of cord to cord and ply to ply.

Plans Rubber Asphalt Plant

The Central Java State Enterprises Office at Semarang has announced plans to establish a factory soon for the manufacture of rubber-asphalt for use in road construction. It also intends to resurrect the turpentine plants in Acheen which were destroyed during the revolution. The State Enterprises Office earned some 160 million rupiahs in foreign exchange in 1951 from commodities produced under its supervision—mainly rubber.

Goodrich Promotes Bossen

Roger G. Bossen has been named manager of the general chemical laboratories of the B. F. Goodrich Co., Akron, Ohio. Mr. Bossen joined the rubber company in 1934 as a chemist in the general chemical laboratory. The following year he was assigned to the laboratory in the company's Plant 3 chemical plant in Akron, and, in 1936, was named a technical superintendent at this plant. A year later he returned to the company's main plant as a raw materials engineer. In 1939 he became a general compounder on all Tire Division products, a position he held until 1946 when he was transferred to the company's tire and tube manufacturing plant at Tuscaloosa, Ala., as manager of compounding. In 1951, he returned to Akron for special assignment to a quality control project in the Tire Division. Mr. Bossen graduated from the University of Minnesota in 1934 with a B.S. in chemical engineering. He is a member of the American Chemical Society and is a registered professional engineer in the State of Ohio.

Wellco Profit Sharing Plan

Wellco Shoe Corp. of Waynesville, N. C., has announced that profit sharing for the fiscal year ended June 30, 1953, amounted to approximately $165 for each and every employee of the company. The firm employs 350 persons in its plants in Waynesville and has 20 exclusive sales representatives covering all 48 states. Every employee with the company six months or longer is eligible for participation in the profit sharing plan. Sales representatives have a separate profit sharing system. Every employee of the company participates in the profit, in one form or another, except officials of the company who are stockholders. Wellco is one of the almost 40 companies in all 5 continents operating under license from Ro-Search, Inc.

Agree to FTC Ruling

B. F. Goodrich Co. and the Goodyear Tire & Rubber Co. have agreed to cease and desist from selling practices in the rubber footwear field which the Federal Trade Commission charges are monopolistic. The companies neither admitted nor denied the practices or that such practices are illegal. The American Biltrite Rubber Co. and the O'Sullivan Rubber Corp. signed similar consent agreements. FTC charged Goodrich with giving discounts of from 5 to 10% based on volume of purchases by shoe manufacturers and shoe repair wholesalers. The Goodrich discounts were said to go as high as 10% when purchases amounted to $5,000 or more. This benefits the big purchaser at the expense of the small, FTC said. The FTC charged that Goodyear granted bonuses payable in merchandise up to 6½% for purchasers of $100,000 a year or more of rubber heels and soles and Neolite materials. The agreements signed by the companies imply an exception to the rule when the purchaser is a middleman who resells to other middlemen. Such a purchaser could receive extra discounts if he was not competing directly with buyers who did not get the same discount.

Bayshore Reports Progress

Bayshore Industries, Inc. of Elkton, Md., reports that it is growing into one of the country's largest manufacturers of toys made from soft, pliable rubber on which non-toxic paints are used. Previously concerned primarily with the manufacture of rubber masks and balloons, the firm started to take an interest in the small toy field about 2 years ago. The returns on this addition to their regular line far surpassed expectations. The firm recently introduced a wire-bending toy patterned after Walt Disney's "Pluto the Pup." As a Disney licensee, the firm plans shortly to be in production of additional characters of the wire-bending type.

ASTM CRUDE RUBBER SUBCOMMITTE HOLDS INTERESTING JULY MEETING

Subcommittee XII on Crude Natural Rubber of Committee D-11 on Rubber and Rubberlike Materials, American Society for Testing Materials, held an interesting meeting on July 1 at the Chalfonte Hotel in Atlantic City, N. J., in conjunction with a meeting of the parent group. Twenty-six members and guests were in attendance.

Norman Bekkedahl (NBS), chairman of the subcommittee, announced that the two procedures for quantitative determination of harmful dirt in crude natural rubber had received no negative votes in letter balloting by the membership of either Subcommittee XII or Committee D-11. However, a comment from one of the advisory members of Subcommittee XII was somewhat unfavorable to the procedures.

On the basis of some experiments in which he examined known quantities of added sand in rubber he suggested that the dirt content of rubber be determined by washing on a mill. It was pointed out at the meeting, however, that sand is only one form of harmful dirt and that washing methods probably would not remove all types of dirt.

Reports on Paris Discussions

Dr. R. D. Stiehler (NBS), leader of the American delegation to the June meeting of Technical Committee 45 on Rubber of the International Organization for Standardization in Paris, France, reported on matters of interest to Subcommittee XII which had been discussed in Paris. The report is summarized as follows:

"In connection with the determination of dirt there was objection to the use of the 235-mesh screen since that size is not available in all countries. It was suggested that consideration be given to the use of a sieve size common to all countries. A working group consisting of members from France, United Kingdom, United States, and Netherlands (coordinator) was established to consider the methods proposed for the determination of dirt.

"It was agreed that the dry ashing procedure should be used for copper determinations and that the copper should be determined as a diethyl dithiocarbamate complex. Also both zinc and sodium salts of this reagent should be studied. The photoelectric method should be used to determine the intensity of color of the complex. There were no discussions on methods for the determination of manganese since other delegations had no experience. The details of methods for copper and manganese were assigned to a working group consisting of members from Germany, Netherlands, United States, and United Kingdom.

"It was agreed that since the subject of raw rubber covers tests for both compounded and uncompounded rubbers, including the technical classification of Hevea rubber, each subject would be considered separately in future agendas of the ISO/TC 45.

"No proposal was submitted at the TC 45 meeting covering the sampling of Hevea rubber, but it was expected that a recommendation would be submitted at the next meeting, when the United States and the United Kingdom will present their views. It was agreed, however, to homogenize the sample of rubber by passing it 6 times through a laboratory mill with a clearance between rolls of 2.5 mm and an unspecified friction ratio.

"In view of the document submitted by the United States it was decided to postpone consideration of the Mooney viscosity test until the next meeting.

"In connection with the cure testing of Technically Classified Rubber it is intended that the cure be run as soon as possible after compounding, and, in addition, storage of the compounded rubber in a closed container of restricted volume is being considered in order to avoid the effects of humidity. The United States agreed to submit information on the Mooney viscometer cure test, and the working group is to report on this test at the next ISO/TC 45 meeting."

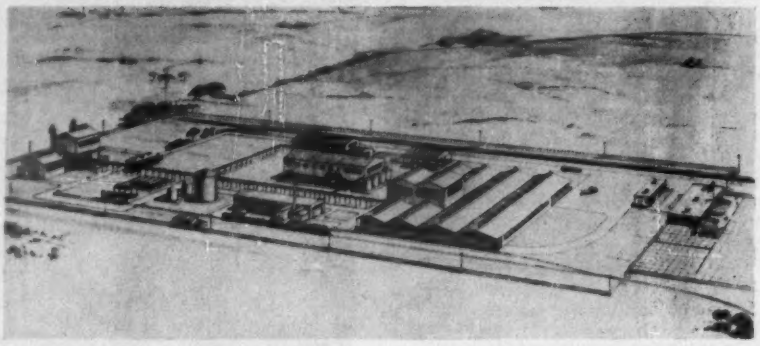
The chairman of Subcommittee XII next pointed out that Subcommittee XXVIII on Statistical Quality Control has been asked to give assistance in developing a statistical plan for sampling bales of natural rubber. J. M. Cameron of the Statistical Engineering Section of the National Bureau of Standards has been assigned by Subcommittee XXVIII to head a task group to study this problem. Between-bale sampling will need the cooperation of user companies after Mr. Cameron's group provides the suggested procedure. As to sampling within the bales themselves, it was mentioned that the method of slicing of an edge so as to get a portion of each sheet has the disadvantage in that it may not be representative. In the baling process any unscrupulous producer could throw all inferior material toward the middle of the bale. A better system of sampling would be to take the rubber from the bale at random.

In connection with the problem of obtaining a standard natural rubber, it was reported by the chairman that Dr. John McGavack of the Plantations Division of the U. S. Rubber Co., recommended that USF grade rubber be considered. Arthur Nolan of Latex & Rubber, Inc., offered to provide for examination some samples of rubber specially packaged in sealed metal containers which he is receiving from the Far East.

R. H. Taylor of Scott Testers, Inc., and formerly of the Guayule Experiment Station of the U. S. Department of Agriculture at Salinas, Calif., presented a report on the effect of moisture on the rate of cure of natural rubber. For precise testing, he recommended that moisture content be determined on each batch of rubber and that corrections be made according to the recipe used. He used the method for determining moisture given in "Specifications for Government Synthetic Rubbers," Reconstruction Finance Corporation, Washington, D. C., Section C-1, January 1, 1951. This procedure was also published as a paper by Tryon in the *Journal of Research* of the National Bureau of Standards, Vol. 45, pp. 362 (1950) and in *Rubber Chemistry and Technology*, Vol. 25, pp. 704 (1952).

It was reported that the Quality Control Bulletin of the Rubber Manufacturers Association will be distributed to members of Subcommittee XII by RMA since this new publication should be of definite interest to the subcommittee members.

ARCHITECT'S CONCEPTION OF NEW GENERAL TIRE CHEMICAL PLANT



Shown above is an architect's conception of the new $6,000,000 chemical plant which is being built just northeast of Ashtabula, Ohio, by the General Tire & Rubber Co. Ground-breaking ceremonies were held on August 6 at the plant site with city and county officials, representatives of Ashtabula industry, and company officials in attendance.

3M Files S.E.C. Statement

Minnesota Mining and Manufacturing Co. is filing a registration statement with the Securities and Exchange Commission covering 145,000 shares of its common stock being sold by certain stockholders. Goldman, Sachs & Co., Kidder, Peabody & Co. and Piper, Jaffray & Hopwood are expected to head the underwriters of the issue. Of the 145,000 shares, 75,000 are a part of the holdings of Archibald G. Bush, chairman of the executive committee, and his wife, and 45,000 shares are a part of the holdings of the estate of Richard P. Carlton, former president of the company, who died in June.

"Where is the new edition of the RUBBER RED BOOK?"

That's the question being hurled at us many times every week.

In a few words, here is the answer:

The 1953-54 issue will go to press during the first week in October and copies should, therefore, be ready for mailing during the week of October 26.

We realize, of course, that many users of the RUBBER RED BOOK are impatient and anxious to get the new edition but no more so than we who have been working all summer to bring it out as early as possible.

It has been a long, hard pull with lots of overtime during the "dog" days of the summer and with all vacations foregone for the time being. Getting out a book of this size—over 1200 pages—is a tremendous and time-consuming task, especially to insure the degree of completeness and accuracy always expected of us.

We're glad it's almost over . . . and we hope that you'll bear with us a few weeks more.

M. E. LERNER,
Editor

CHICAGO MOLDED PRODUCTS DEVELOPS POLYSTYRENE-RUBBER RIGID SHEET

A new kind of rigid sheet material that promises to open up a host of new uses for plastics in the home and industry has been developed by the Campco Division of the Chicago Molded Products Corp., 2717 N. Normandy Ave., Chicago 35, Ill. The sheet is made by forcing a "plastic alloy" made of polystyrene and rubber through a heated die. Since the process is continuous, sheet of any length can be made with widths ranging from 26 to 58 inches and thicknesses ranging from 0.005 to 0.125 inches. Color possibilities are said to be unlimited.

Significance of the development lies in the advantages that these new sheet materials, called "Campco S-300," offer industry. According to Edward F. Bachner, Jr., vice-president in charge of the Campco Division, in many applications they will easily compete with steel, aluminum, wood, glass, rigid vinyl, acetate, fiberboard, rubber, and in some cases textiles, as well as molded plastics.

Campco sheet can be formed by any of the available methods in use today: in male and female molds, manual stretch forming, or vacuum forming. The last is potentially the most important commercially. The sheet is warmed, locked in place over a mold that reproduces the exact shape and minute detail desired, then vacuum is applied. In less than a second the sheet snaps into the mold and cools into a fixed shape, the company states.

Simple Production Equipment

Only the simplest production equipment is needed. Molds can be made of wood, plaster, cast aluminum, metallized plaster, metallized wood, sprayed aluminum shells, resin-impregnated plaster, etc. Alteration of molds is relatively simple, the company states. Mold making requires only a fraction of the time required for conventional closed die molding. Multiple piece forming can easily be accomplished and is now being done, for example, for TV tube backs, and other products.

From the consumer standpoint, Campco sheet—when used in refrigerators, clothes hampers, foodhandling trays, wall tile, splash panels, freezer lids, drawers, table tops, even automobile interiors—provides a smooth, colorful, easy-to-clean surface that resists damage from impact, and yet is strong and extremely light in weight. Since the sheet is inexpensive in first cost and in processing, product costs can be shaved without sacrificing product performance, the concern maintains.

A number of consumer products now being readied for marketing will use Campco sheet. Several leading refrigerator makers, for example, are planning to use Campco S-300 for interior door liners, drip pans, crisper units, meat keepers, and similar parts. Here the sheet material will often out-perform its predecessors in that it adds insulating value to the door liner, helps reduce weight, yet it is just as easy to clean and will not crack, rust or dent, the firm states.

In the automotive field, Campco gives promise in replacing seat backs, interior door panels, scuff boards, instrument panels, and is being tested for car roof interiors to replace conventional fabric. The company states that cleaning will be simpler and manufacturing costs less with the new material.

Translucent Campco Available

In translucent form, Campco can serve as domelight lenses or reflectors for interior lighting fixtures in the car, in the home, and in manufacturing plants. It is also under test for contour chairs, and is standard today for TV tube masks. Its potential uses as clock, radio, sewing machine, or business machine housings are now under study.

Another widespread use forecast by Mr. Bachner, is in the display, advertising, and printing fields. Easy formability permits production of colorful display units in which the colored design is first printed on the flat sheet before the forming operation. Campco sheet is said to take color easily; if the ink or paint needs protection, it is a simple matter to protect it with an overlay of transparent plastic. This opens up new possibilities in signs and markers of all types, the company believes.

Use in Printing Industry

It is also possible, according to application engineers, to use Campco sheet as an inexpensive yet strong material for newspaper mats and printing plates.

The Campco Division of the Chicago Molded Products Corp. is located in a new $500,000 plant in Chicago. The plant is equipped to produce 500,000 pounds of the sheet per month. Plans are being studied for warehousing standard sizes of sheet, and standard colors, throughout the country as steel sheet is now warehoused, the company revealed.

COMPARISON OF CAMPCO S-300 AND OTHER PLASTIC EXTRUDED SHEET

	Campco S-300	*Rigid Vinyl*	*Cellulose Acetate*
Specific gravity	1.04–1.06	1.34–1.37	1.27–1.32
Elongation, %	22–30	....	15.45
Tensile, psi	4,000–5,000	8,000–10,000	4,500–6,500
Impact	1.5 – 3.0	0.4–0.7	1.5 – 2.0
Heat distortion	155–163° F.	130–140° F.	135–160° F.
Flammability	low	self-extinguishing	high
Water absorption % 24 hr.	0.10	0.05–0.15	3.5 –10.0
Yield psi	26,000	20,000	21,500
Cost	lowest	25–50% higher	15–25% higher

PHYSICAL PROPERTIES OF CAMPCO S-300

Tensile strength, psi	4,000–5,000
Elongation, %	22–30
Modulus in tension $x10^5$, psi	3.3 – 3.8
Impact strength	
—Izod notched	1.5 – 3.0
—Izod unnotched	11–18
Flexural strength	no failure
Heat distortion, °F.	155–163
Flammability, in/min.	1.2
Rockwell hardness	M30–40
Specific gravity	1.04–1.06
Thermal coeff. expansion, in./in./°C.	6.5—8.5 x 10^{-5}
Yield point, psi	26,000

Note: Properties given are for the raw material; sheet properties may vary slightly.

Develops Two New Resins

Two new synthetic resins which will improve the impact strength and toughness of molded plastic products have been developed by the Goodyear Tire & Rubber Co. The new resins will be offered to the plastic industry under the name of "Plio-Tuf". Because the new resins give products greater hardness, higher resistance to heat and better tensile strength, they are expected to expand and create more uses for plastic materials, the company said. Products molded from Plio-Tuf will resist action of acids and alkalies and will not be damaged by a large number of staining materials which plague housewives. The properties of Plio-Tuf are said to make it ideal for molding such typical end products as automotive parts, television screens, luggage, plastic pipe and numerous other items which require high impact strength. Plio-Tuf is a white free-flowing powder which can be made into sheets, rods or tubes by calendering or extruding. Also, complex shapes can be formed by conventional plastic molding techniques. Plio-Tuf resins are not resin-rubber blends. The resins can be plasticized with rubber to give even greater impact strength, Goodyear said.

Chemical Industries Exposition

Already nearly 500 exhibitors have engaged space for the Exposition of Chemical Industries which will be held during the week of November 30 to December 5 at the Commercial Museum and Convention Hall in Philadelphia, Penna. A one-level display area at the Convention Hall is over 40% larger than that occupied by the last display of its kind. The forthcoming display will be the twenty-fourth in the series, marking the rise of chemical industries in the United States to world supremacy since the first exposition in 1915. Among manufacturing material to be given first public disclosure at Philadelphia will be an application of the new elastomer Hypalon as an impeller in small chemical process pumps designed for handling acids. There will also be a complete line of hard rubber pipes and fittings. The exposition is directed by the International Exposition Co. with headquarters at 480 Lexington Ave., New York 17, N. Y.

Tarbox Joins Dewey & Almy

Thomas C. Tarbox

The Organic Chemicals Division of the Dewey & Almy Chemical Co. has appointed Thomas C. Tarbox to head its sales force in the Mid-Atlantic states area. Mr. Tarbox, who will work out of New York City, will handle sales of all Darex organic chemicals to customers in the rubber, chemical, paint, textile and paper industries in the area. Mr. Tarbox was formerly associated with the Esso Standard Oil Co. where he worked with lubricants and fuels. A chemical engineering graduate of Syracuse University, he served in the Air Force during World War II.

Organize Summit Chemical Co.

W. David Anderson and Hal P. Headley have formed a partnership known as Summit Chemical Co. with offices at 10½ South High St., Akron, Ohio. They will be manufacturers' agents and distributors for chemicals and other materials used in the rubber industry. Mr. Anderson opened an office for Godfrey L. Cabot, Inc. in Akron in 1941 and was the local manager for the next ten years. He has represented the same company in New York, since leaving Akron in 1951. Mr. Headley has been with the B. F. Goodrich Co. for the past 17 years and has worked in the research, tire construction and tire compounding development and technical factory compounding groups.

To Produce New Pillow Line

Amertex Manufacturing Corp., New York, N. Y., has commenced the manufacture of a new line of premium size molded latex foam sleeping and decorator pillows. The entire plant, located in Portsmouth, Va., has been converted to large-scale production of these items, enabling a full schedule of approximately 18,000 pillows a week of both kinds. This, it is believed, will make Amertex one of the major manufacturers, of foam rubber pillows in the world. Company officials stated that the bulk of production would be sold to pillow manufacturers, with a restricted number of the decorator pillows sold uncovered directly to large retail outlets.

Emery Announces Appointments

Emery Industries, Inc., has announced the appointment of a number of district sales managers in the Chemical Sales Division. James W. Ritz, formerly head of the Philadelphia office, has been named Eastern District manager. He will retain his Philadelphia headquarters extending its coverage to include New Jersey, Delaware, Maryland, the District of Columbia and portions of Pennsylvania and New York. Harry D. Armitage will continue at his present location in the Woolworth Building, New York, N. Y., as district manager at large. Willard A. Colby has been named Southern District manager with offices in Charlotte, N. C. He is in charge of all chemical sales in Virginia, North Carolina, South Carolina, Florida, Tennessee, Georgia, Alabama and Mississippi. Two new men have been assigned to this district: E. W. Sack, formerly a production supervisor at Cincinnati, and C. T. Burgess, who has replaced J. P. Clancy. Mr. Clancy has been transferred to Boston to assume sales responsibility for a portion of the New England area. In addition, N. F. Reinert has been shifted from Chicago to the Eastern District. He has been succeeded by W. J. Ryan, formerly associated with the Barrett Division of the Allied Chemical & Dye Co.

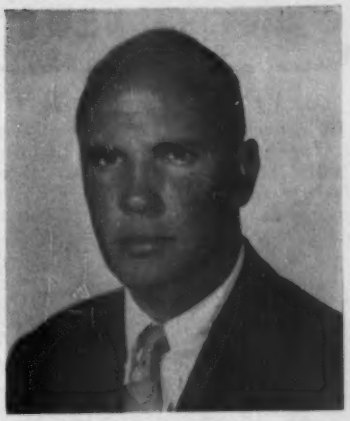
To Enter Ammonia Field

Columbia-Southern Chemical Corp. recently announced plans to enter the ammonia production field. E. T. Asplundh, president, said that the firm plans to construct its first ammonia producing facility soon at Natrium, W. Va. Contracts for the construction work will be let in the near future and the firm expects to be in production by late 1954. Hydrogen, a by-product of the electrolytic production of chlorine and caustic soda at Natrium, will be utilized in the ammonia production. To date, the Natrium plant has burned the existing hydrogen supply as a fuel. Although the chemical industry has been constantly increasing production facilities, ammonia has been in short supply since World War II. A basic chemical product used by a wide variety of consuming industries, the product is finding increased utilization as a base chemical in the manufacture of fertilizers, synthetic fibers, plastics, cattle feed, and as a raw material for various synthetic chemicals. The Natrium location was selected due to the availability of hydrogen supply and because industrial and agricultural outlets can be readily serviced from the West Virginia facility.

Acrylonitrile Price Reduced

An immediate reduction of 16% in the tankcar price of acrylonitrile was recently announced by the Monsanto Chemical Co. and the American Cyanamid Co. The price was reduced from 43 to 36c a pound. A corresponding reduction was also made in the carload and truckload drum prices of the material which will be priced at 37½c per pound. Less than truckload prices of drums will be priced at 38½c per pound.

Hewitt-Robins Promotes Goodyear



Austin Goodyear

Election of Austin Goodyear as a vice-president of Hewitt-Robins Inc. was recently announced. Mr. Goodyear joined the company in 1941 and became production manager of its Passaic, N. J., plants six years later. In July, 1952, he was appointed general manager of the Conveyors Division, which produces conveyor machinery and vibrating screens, and of the Rubber Division, which makes conveyor belting, hose and other industrial rubber products. He was elected a director in August, 1952.

Kentucky Synthetic Wins Awards

On August 31, 1953, the Kentucky Synthetic Rubber Corp. of Louisville, Kentucky, was presented the Award of Merit from the National Safety Council and the Distinguished Service to Safety Award from the Louisville Safety Council for the completion of 2,000,000 accident-free man-hours over a period of thirty months. A special program for presentation of these awards was held at the plant. In attendance were representatives of various civic and union groups and governmental organizations who congratulated the 200 employees present on their outstanding safety record. The Kentucky Synthetic Rubber Corp. currently leads all other government-operated plants in the synthetic rubber industry in accident-free man-hours worked. This record, management says, results from management-employee teamwork in promoting safe work habits.

Nuodex 100 VT Fungicide

Nuodex Products Co., Inc., Elizabeth, N. J., has announced an improved fungicide specifically developed for use in vinyl-coated fabric or paper used for shoe linings, where white or light colors are desired. The new fungicide, "Nuodex 100 VT," is non-irritating and non-sensitizing to the skin, the company states. It is stabilized so that heat encountered during normal milling and curing operations won't cause discoloration. The new fungicide comes in liquid form and is easily incorporated in vinyl coating compositions, where it is compatible with all commercial resin-plasticizer-stabilizer combinations.

NEWS IN BRIEF

U. S. Rubber is sponsoring a portion of the Dave Garroway television program, "Today", three times a week for a period of six weeks to merchandise its Koylon foam rubber mattresses. The sponsorship began the week of September 14.

The Society for the Advancement of Management, 74 Fifth Ave., New York 11, N. Y., has just published its new "Glossary of Terms used in Methods, Time Study and Wage Incentives." Copies of the publication are available at $1.00 each.

A 20-page illustrated booklet entitled "How to Make Your Own Slide Film Presentations for Less than $20," is available upon request from the Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Both Geon vinyl plastic and Hycar rubber are used in a new type sink disposal unit manufactured by the Schaible Co. of Cincinnati, Ohio. The Geon plastic is used for the stopper while the Hycar rubber is used as a shock absorber and throat baffle.

A new technical bulletin on the ethylene amines—ethylene diamine, diethylene, triamine, triethylene tetramine, and tetraethylene pentamine—has been issued by the Carbide & Carbon Chemicals Co. Ask for Bulletin F-8163.

New "Tri-Clamp" stainless steel joint clamps made by the Tri-Clover Machine Co., Kenosha, Wisc., for sanitary milk plant pipelines utilize Hycar rubber gaskets for perfect operation.

Lightweight, disposable, transparent shower caps made of Pliofilm are being introduced as a low-cost extra service for hotels and motels as well as for home use by the Cleenz Chemical Co. of Brooklyn, N. Y.

Goodrich has announced a $12,000,000 brick and steel addition to its distribution center at Memphis, Tenn. The new addition will increase the warehouse area by 20,000 square feet, bringing the over-all area to more than 65,000 square feet.

Occupational accidents in 1952 cost American industry $45 per worker, according to the National Safety Council's statistical annual, "Accident Facts."

A new, 40-page tire, battery and accessory replacement data manual for passenger cars and light trucks, 1938 through 1953, has just been issued by Goodrich.

"Data for X-Ray Analysis," in two volumes, has recently been published by the Research & Controls Instruments Division of the North American Philips Co., 750 South Fulton Ave., Mount Vernon, N. Y. Volumes I and II are available at $2.00 each.

Goodyear has completed what is said to be the largest industrial warehouse in the south at Gadsden, Ala. The new warehouse measures 1,000 by 400 feet.

A "Lantuck" non-woven fabric bag which "breathes" is now being used to package a desiccant which absorbs moisture from the air in flexible and rigid military and commercial shipping containers, according to the Wellington Sears Co., New York, N. Y., distributor of the fabric. Lantuck non-woven fabric is made from cotton fibers and Geon vinyl plastic latices.

A 12-page technical article describing power generation and distribution trends in the chemical and petroleum industries has been announced by the General Electric Co., Schenectady, N. Y.

Complete engineering data necessary for the successful use of "EC-1120-PC Dielectric Sealer" are contained in a bulletin issued by the Adhesives and Coatings Division of Minnesota Mining & Manufacturing Co., 423 Piquette Ave., Detroit 2, Mich.

Heater ducts on the Model 340 twin-engine passenger liner produced by the Consolidated Vultee Aircraft Corp., are being coupled with glass cloth connectors coated with SE-101 silicone rubber.

The low tension ignition harness on the Boeing Stratocruiser is protected by an outer coating of Geon vinyl plastic latex.

In a new method of vacuum packaging, a British firm designed a Pliofilm-laminated film wrap for carrying foods of sound diet in special 24-hour high altitude ration packs which were used by the British expedition in conquering Mt. Everest.

Seiberling Rubber and the Standard Oil Co. of Ohio have signed a contract making the rubber company a major supplier of Atlas tires sold in Sohio's service stations throughout Ohio.

Goodrich's industrial advertising campaign has been called "the best of 1952" and H. E. Van Petten, advertising manager of the company's Industrial and General Products Division, has been named "adman of the year" by the magazine, *Industrial Marketing*.

"Working Together for Safety" is the title of the new employee rules manual published by the National Safety Council. The 32-page booklet contains instructions in safe work habits applicable to employees in most plants.

U. S. Rubber has negotiated an agreement with the Champlin Refining Co. of Enid, Okla., for the sale of U. S. Royal passenger, heavy service, farm and industrial tires, through Champlin outlets.

Featherweight lamp shades molded from Geon rigid vinyl plastic are being manufactured by the Celomat Corp. of New York City. The new lamp shades are said to have 30% better light dispersion than glass shades.

"Water Dispersible Colors for Use in Latex," is the title of a new technical report issued by the Rubber Chemicals Division of DuPont. Ask for Report No. 53-1.

A comprehensive catalog on the proper installation and care of packings has been published by the Mechanical Goods Division of U. S. Rubber.

Colorful new trimming material for skirts, curtains, aprons, etc., is being produced by the David Traum Co. of New York City. Vinylite resins in the trimming soften sufficiently when ironed to stick to a fabric without damage.

Tote baskets to carry jet engine compressor blades, used at the Utica Drop Forge & Tool Co., Clayville, N. Y., are being plastic-coated with a newly-formulated vinyl plastisol made from Geon paste resin. The plastisol is formulated by the Stanley Chemical Co., of East Berlin, Conn.

The full line of industrial fire protection hose which is manufactured by the Quaker Rubber Corp., Philadelphia, Penna., is described in a new bulletin recently published by the company.

The many ways of using Kralastic in extrusion and injection molding are outlined in a 20-page booklet just published by the Naugatuck Chemical Division of U. S. Rubber.

American Viscose Corp. has closed its Cleveland, Ohio, sales office. Textile yarn customers in that area will be handled by the Philadelphia district sales office.

Use of vinyl plastic as a method for reproducing exact replicas of various animal vascular systems has been perfected at the Anatomic Institute of Turin University, Torino, Italy. The new process makes use of Geon vinyl latex 576.

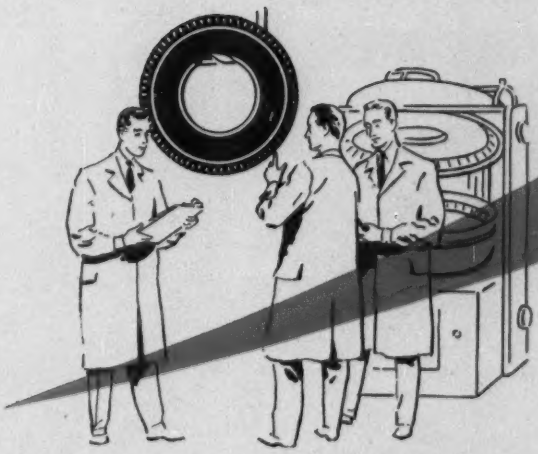
Eastern Industrial Services, Inc., Cambridge, Mass., has introduced two new thermoplastic products which afford protection against the sun's heat, glare and ultra violet rays. One, called "Thermoglare Film" is a spray-on coating for windows, while the other, "Thermoglare Sheet", is a solid sheet plastic designed to be used instead of window glass.

Koroseal is being used by the Lockheed Aircraft Corp. at its Burbank, Calif., plant, as a tank lining separating acid solutions used in the processing of aluminum.

Kaykor Industries, Inc., Yardville, N. J., has announced the availability of "Vyflex" rigid polyvinyl chloride plates 1/16 to 1-inch thick, sheeting .012 to .025-inch thick, and other special forms made from completely unplasticized and unmodified polyvinyl chloride.

"Technical service always available"

SERVICE in your plant



The offer of technical service which appears in our advertising means what it says. Our technical men, selected for their knowledge-in-depth of rubber compounding, are qualified to join you in solving the knotty problems which so often crop up. It is not unusual to find members of our staff working in rubber shops, shoulder to shoulder with the home team. Why not take advantage of this service when you need it... we are ready at any time to go the whole distance with you.

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COLUMBIAN CARBON CO. · BINNEY & SMITH CO.

MANUFACTURER DISTRIBUTOR

SAF (Super Abrasion Furnace)
STATEX®-125

HAF (High Abrasion Furnace)
STATEX-R

MPC (Medium Processing Channel)
STANDARD MICRONEX®

EPC (Easy Processing Channel)
MICRONEX W-6

FF (Fine Furnace)
STATEX-B

FEF (Fast Extruding Furnace)
STATEX-M

HMF (High Modulus Furnace)
STATEX-93

SRF (Semi-Reinforcing Furnace)
FURNEX®

COLUMBIAN CARBON CO. • **BINNEY & SMITH CO.**
MANUFACTURER DISTRIBUTOR

NAMES IN THE NEWS

DAVID K. USHER, assistant manager of the Airfoam Division of the Goodyear Tire & Rubber Co., has been appointed to attend a three months' course in advanced management training in the Graduate School of Business Administration at Harvard University.

WADE C. JOHNSON, manager of tire testing for the Goodyear Tire & Rubber Co., has been chosen as vice-chairman for the Akron-Canton district of the Society of Automotive Engineers.

O S. DOLLISON, vice-president of the Republic Rubber Division of the Lee Rubber & Tire Corp., has announced his retirement as of October 1.

HAROLD E. SPONAUGLE, associated with the National Rubber Machinery Co. since 1947, has been appointed to the Sales Department of the Tire Machinery Division of the company.

ROBERT L. WESTBEE, associated with the Minnesota Mining & Manufacturing Co. since 1933, has been elected a vice-president of the company to head the new Electrical Products Division.

JESSE ADAMS was recently presented with a gold pin and $100 at an honorary dinner celebrating his 25 years of service at the Pioneer Division of the Witco Chemical Co. at Lawrenceville, Ill.

J. SCOTT BROWN, formerly chief engineer of the Naugatuck Chemical Division of the U. S. Rubber Co., has been appointed manager in executive charge of all activities at the Kankakee Ordnance Works, Joliet Arsenal, Joliet, Ill.

F. W. BORCHERS, associated with the Bristol Co. since 1922, has been appointed general sales manager of the company with headquarters at Waterbury, Conn.

R. J. PATRICK, formerly associated with the Seiberling Rubber Co., has been named manager of truck tire sales for the Dayton Rubber Co.

IRVING ASH, formerly associated with the Cello Film Corp., has joined the Baker Castor Oil Co. where he will be responsible for sales development and the expansion of uses for castor oil and its derivatives.

MAURICE O. BARR, previously assistant sales manager of the Associated Lead & Zinc Co. of Seattle, Wash., has been named sales manager of the company.

ARTHUR W. FASOLD, associated with Hewitt-Robins Inc. since 1947, has been appointed assistant manager of the Commercial Research Department of the company.

W. F. BIRD, formerly executive vice-president of the Collins & Aikman Corp., has been elected president of the company succeeding Albert R. Jube, who has been elected chairman of the board.

JEWELL R. BENSON, formerly associated with the Asphalt Institute, has been named chief engineer of Rubarite, Inc., with headquarters in the company's western office in Denver, Colo.

R. W. VAN TUYLE, associated with Emery Industries, Inc., for the past 19 years, has been elected vice-president in charge of manufacturing and a director of the company.

DR. CHARLES BECKETT, associated with the National Bureau of Standards since 1950, has been appointed chief of the Thermodynamics Section.

Firestone Announces Promotions

Firestone Tire & Rubber Co. has announced the promotion of W. E. Lyon to the position of director of tire engineering and development. J. J. Robson, formerly manager of tire engineering, has taken on additional duties as manager of tire engineering and development. M. P. Hershey has been named manager of the department in charge of passenger, airplane, racing and special product tire design. T. A. Robertson has been named manager of the department in charge of truck, bus, tractor, implement and earthmover tire design. K. W. Brandau has been named manager of the Development Compounding Department. P. D. Bowers has been appointed manager of the Service Compounding Department. G. H. Wallace has been named manager of the Analytical Laboratory Division.

Mr. Lyon joined Firestone in 1929 after graduating from Cornell University where he received his engineering degree. In 1940, after 11 years in the Tire Engineering Department, he was named manager. In 1950, Mr. Lyon was named manager of tire development, the position he held prior to his present promotion. Mr. Robson joined the company in 1932 after graduation from the Massachusetts Institute of Technology, and served in the Engineering Department in Akron until World War II. From 1946 until 1949, he was manager of the West Coast Division of the Manufacturers Sales Department and since 1949 has been in Akron as manager of tire engineering.

Thermomat Names Wyrough & Loser

Thermomat Co., Inc. of Trenton, N. J., manufacturers of radiant panels for industry, have announced the appointment of Wyrough & Loser, 143 E. State St., Trenton, N. J., as manufacturer's representatives.

Goodrich Promotes Sarbach

Donald V. Sarbach

Donald V. Sarbach has been named technical manager of the New Products Development Department of the B. F. Goodrich Co. Mr. Sarbach joined the company in 1937 and was first assigned to the company's general chemical laboratories in Akron. In 1938, he transferred to the raw materials inspection and development department and then to the department of synthetic rubber research and adhesives. In 1943, Mr. Sarbach entered the field of rubber compounding and development, working with sponge rubber, molded, sheeted and extruded goods and Koroseal products. In 1947, he was transferred to the company's Tire Division to do development work on new materials, inner tubes and the tubeless tire. In 1950, Mr. Sarbach was transferred to the works technical group as a development engineer, concentrating on such problems as Koroseal sponge, new blowing agents, ozone resistance of rubber and GR-S, Teflon coatings and new processes. He was named manager of the company's general chemical laboratories in 1951. Mr. Sarbach graduated from the University of Nebraska in 1934 with a B. S. degree in chemistry. He is a member of the Rubber Division of the American Chemical Society, the Akron Rubber Group, Phi Lambda Upsilon, national honorary chemistry fraternity, and Alpha Chi Sigma, national professional chemistry fraternity as well as the American Rocket Society.

Appointed Purchasing Agent

Crescent Co., Inc., Pawtucket, R. I., recently announced the appointment of E. Oliver Hanson as their new purchasing agent succeeding James Sanek. Mr. Hanson was graduated from the University of Alabama in 1935 with a Bachelor of Science Degree in Banking and Finance. He has served in the past, as purchasing agent for the Keeney Manufacturing Co. and also for the Hartford Steel Ball Co. Recently, Mr. Hanson served as Director of the Connecticut Purchasing Agents Association. He has also been active in a number of civic associations in his home community of Windsor, Connecticut.

ADDITIONAL TECHNICAL PUBLICATIONS OF BRPRA MADE AVAILABLE

Abstracts of some of the recent publications issued by the British Rubber Producers' Research Association are published from time to time in RUBBER AGE. These booklets, which cover research work conducted by various members of the BRPRA staff, may be secured by writing the Association at 19 Fenchurch Street, London E. C. 3, England. Abstracts of some of the more recent publications follow:

Large Elastic Deformations of Isotropic Materials. Part IX—The Deformation of Thin Shells, by J. E. Adkins and R. S. Rivlin. (Publication No. 161): The theory of the large elastic deformation of incompressible isotropic materials is applied to problems involving thin shells. The inflation of a circular diaphragm of such material is studied in detail. It is found that the manner in which the extension ratios and curvatures vary in the immediate neighborhood of the pole of the inflated diaphragm can be determined analytically. However, in order to determine their variation throughout the inflated diaphragm a method of numerical integration has to be employed. Although this is, in principle, valid for any form of the stored-energy function, the calculations are carried through only for the Mooney form. Finally, the problem of the inflation of a spherical balloon, which has already been dealt with by Green and Shield, is discussed in further detail.

The Molecular Complexity of Sulfur in the Liquid and Vapor, by G. Gee. (Publication No. 162): Previously published data are re-examined, in the light of current theories of the properties of polymer solutions, to give new estimates of the molecular complexity of liquid sulfur. It is concluded that polymeric sulfur appears rather abruptly at 159° C. as the temperature is increased, the proportion of polymer in the equilibrium liquid then rising steadily with temperature. The chain-length of the polymer passes through a maximum (estimated as 10^6) at 166° C. The other main components of liquid sulfur are cyclic structures in which S_8 largely predominates, while S_6 is present to an appreciable extent.

Apparatus for the Measurement of the Dynamic Shear Modulus and Hysteresis of Rubber at Low Frequencies, by W. P. Fletcher and A. N. Gent. (Publication No. 163): An apparatus is described which subjects a rubber test-piece to a force in simple shear, varying sinusoidally with time in the frequency range 0.0017-17 c/s; the instantaneous values of force and displacement being measured by photoelectric pickups. From the display on the screen of a cathode-ray tube of the mechanical hysteresis loop described by the vibrating rubber, measurements are made which allow calculation of the dynamic shear modulus and hysteresis. Typical results are given.

Experiments on the Mechanics of Rubber. Part I. Eversion of a Tube. Part II. The Torsion, Inflation, and Extension of a Tube. Part III. Small Torsions of Stretched Prisms, by A. N. Gent and R. S. Rivlin. (Publication No. 164): Measurements are made of the changes which take place in the dimensions of rubber tubes when they are turned inside out. These are compared with the values predicted from the theory of large elastic deformations of incompressible isotopic materials.

Mastication of Rubber. Part I. Mechanism of Plasticizing by Cold Mastication, by M. Pike and W. F. Watson. (Publication No. 165): Plasticizing of rubber by mastication or milling has been a basic technological operation since its discovery in the early days of the rubber industry. The dependence of plasticizing efficiency on the variables such as oxygen concentration, temperature, and design of mill, is now well estabished, but the nature of the controlling reactions has remained obscure. The present purpose is to present a general explanation for molecular breakdown by cold mastication which conforms with established results and with further data derived from the experiments described.

The Load Dependence of Rubber Friction, by A. Schallamach. (Publication No. 166): It is shown experimentally that the load dependence of rubber friction can be explained as being due to the load dependence of the true area of contact between rubber and track if the surface asperities of the rubber are assumed to be hemispherical.

The Addition of Thio-Compounds to Olefins. Part III. Reactions of Tri- and Hexa-Methylenedithiols, and of Bisthiol-Adipic and -Sebacic Acids, by J. I. Cunneen. (Publication No. 167): Certain dithiols and bisthiol-acids react with natural rubber and with some related simple olefins in an analogous manner to the corresponding monofunctional compounds. The physical characteristics of the vulcanizates obtained from natural rubber and bisthioladipic acid are described.

Crystallisation and Tensile Strength of Vulcanized Natural Rubber Compounds, by S. H. Morrell and Jan Stern. (Publication No. 168): The effect which changes in the degree of cross-linking have on the crystallization of stretched rubber has been studied by observing the densities of a series of peroxide-cured natural rubber compounds. It was found that at any one elongation, crystallization first increased and then decreased with increase in the degree of cross-linking. The significance of this maximum and the relation between crystallization and tensile strength are discussed.

Abrasion Pattern on Rubber, by A. Schallamach. (Publication No. 169): It has been observed that an array of nearly parallel ridges is often produced by abrasion on rubber surfaces. This array is called the "abrasion pattern". The ridges run at right angles to the direction of abrasion, and their profile is asymmetrical with respect to the direction of abrasion. Various properties of the abrasion pattern are described, and its use in the elucidation of the mode of abrasion of tires is discussed.

2-Mercaptobenzothiazole Derivatives. Part I. The Reaction of Di (benzothiazol-2-yl) Disulfide with Olefins, by C. G. Moore; Part II. The Thermal Decomposition and Isomerization of 2-Alkyl- and 2-Alkenyl-thiobenzothiazoles and 3-Alkyl-and 3-Alkenyl-2-thiobenzothiazolines, by C. G. Moore and E. S. Waight. (Publication No. 170): Part I shows the reaction of di(benzothiazol-2-yl) disulfide (I) with *cyclo*hexene at 139° yields 2-mercapto-benzothiazol (II), 2-(*cyclo*hex-2-enylthio) benzothiazole (III), and 3-*(cyclo*hex-2-enyl) 2-thiobenzothiazoline (IV). A brief kinetic study of the reaction supports a free-radical chain mechanism. The influence of olefin structure and concentration on the extent and course of the reaction is discussed and, in particular, the reaction of (I) with rubber is considered.

In Part II, a study of the thermal treatment of variously constituted 2-alkyl- and 2-alkenyl-thiobenzothiazoles (I) and 3-alkyl- and 3-alkenyl-2-thiobenzothiazolines (II) reveals that two reaction courses are operative: (i) the termal isomerization of (I) to (II) which is reversible when R = alkenyl; and (ii) the thermal decomposition of (I) to 2-mercaptobenzothiazole (III) and a hydrocarbon derived from R by loss of hydrogen. Examples of the sole operation of (i) and (ii) are found in the cases of (I; R = allyl, *cyclohexyl* respectively). All the other compounds studied show mixed reaction characteristics. A kinetic study of the decomposition of reversible isomerization of (I; R = *cyclo*hexyl, allyl, and *cyclo*hex-2-enyl) indicates that the reactions are of the first order. The mechanisms of the decompositions and isomerizations are discussed and the relation of the reversible isomerizations of (I) and (II) (R = alkenyl) to the Claisen and analogous rearrangements is detailed.

New Titanium Dioxide Plant

According to a recent announcement, the Calco Chemical Division of the American Cyanamid Co. will build a $14,000,000 plant for the production of titanium dioxide on the outskirts of Savannah, Ga. Titanium dioxide is marketed by the company under the trade name "Unitane". Construction of the new plant will begin in the last quarter of this year and is expected to be completed early in 1955. It will occupy a 1,600-acre tract of land along two miles of the south shore of the Savannah River. The plant will be built to permit the doubling of output at some future date. This will be the company's third facility for the production of titanium dioxide.

Hathaway Gets Government Post

Norman E. Hathaway

Norman E. Hathaway, sales manager of the Industrial Chemicals Department of the Davison Chemical Corp., has been granted a six months' leave of absence of the company to serve as director of the Chemicals and Rubber Division of the Chemical, Rubber and Forest Products Bureau in the successor agency to the National Production Authority which is being organized by the Department of Commerce. In his absence from Davison, his duties there will be assumed by David P. Barrett, assistant sales manager of the Industrial Chemicals Department. Mr. Hathaway was born in Corvallis, Ore., and attended schools in Kansas City, Mo., and Missouri Valley College, Marshall, Mo. He was a 1942 graduate in chemical engineering of the University of Maryland. He served with the U. S. Navy from 1943 to 1946 and holds the rank of lieutenant, senior grade, in the Naval Reserve. Coming to Davison in 1946, Mr. Hathaway was first in technical sales, then director of technical service, later field service engineer and was appointed to his present post in 1951. He is a member of the American Chemical Society, American Institute of Chemical Engineers, American Society of Refrigerating Engineers and Commercial Chemical Development Association.

Reorganizes International Sales

In order to provide even greater customer service, and to develop more specialized selling techniques for today's markets, the Sales Department of the International Division, U. S. Rubber Co. has been reorganized under the direction of a general sales manager and six managers. G. J. Russ has been appointed to the newly created post of general sales manager, and will be responsible for all sales activities. He will also integrate the department activities with those of staff departments and other divisions of the company. Other new positions, and the men appointed to them are: manager of branch sales, A. N. Reeves; manager of distributor sales, R. J. Thomas, manager of head office and government sales, A. Eaton-Clark; and manager of product departments, W. J. Mulvihill, Jr. J. T. Kuntz continues as manager of sales development, and H. L. Reynolds as manager of sales operating.

Snell Forms New Division

Foster D. Snell, Inc., consulting chemists and engineers, have announced the formation of an Engineering Physics Department in the Engineering Division of the firm. Walter L. Hardy, with more than fifteen years of industrial and military experience as a chemical engineer is director of engineering and Joseph P. McGill, with four years of industrial experience as a physicist, will be in charge of the Engineering Physics Department. The new department will conduct investigative work on various problems in the physical sciences. One of its primary functions will be to study shock and vibration and their effect on packaged and unpackaged instruments and delicate equipment. For this purpose, the Foster D. Snell Laboratories have developed a drop tester which can accurately determine the fragilities of instruments and other delicate equipment.

Since the shock loads and frequencies excited during an impact are the most severe encountered by a transported item, the Snell Drop Tester simulates these rough-handling forces enabling a practical determination of equipment fragility. A determination can thus be made, with the Snell Tester, of equipment "g's" or the maximum acceleration at any duration of impact which the item can take without impairment of function. Instruments that fail primarily due to dynamic stresses, are best suited to this type of test. Because of ideal instrumentation used for deflection and acceleration recording, cushioning transmissibilities and dynamic damping coefficients may also be obtained, within practical limits, by a procedure utilizing this unique tester. This work of the Engineering Physics Department will aid instrument designers and packaging personnel in reducing equipment damage caused by shock and vibration hazards of shipping and handling and reducing packaging costs, the company states.

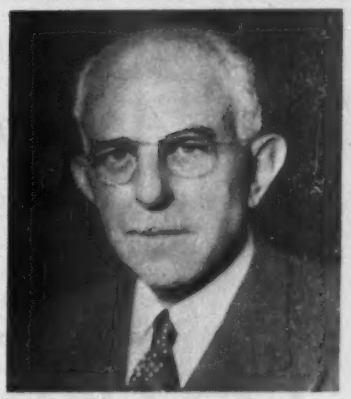
Gussett Moves to Larger Quarters

Gussett Boiler & Welding, Inc., has moved to new and larger quarters at 1545 Whipple Road S. W., Canton 8, Ohio. The new telephone number is Canton 7-3413. The new, modern daylight plant includes many new facilities including a 20-ton capacity crane. The new facilities will greatly increase the company's productive capacity and permit numerous production refinements. Gussett Boiler produces vulcanizers, steel tanks, pressure tanks, fabricated machine bases and frames and other fabricated steel equipment used by the rubber industry.

NRM Plans Expansion Program

National Rubber Machinery Co. is constructing a 400-foot-long building as part of a $500,000 expansion and rehabilitation program, for its plant in Akron, Ohio. The new assembly and factory office building will add about 50% to the company's floor space. Several old buildings on the site will be torn down to make room for the new unit which will be 62 feet in depth. Construction will be of brick and steel with aluminum sash and wood block flooring.

Named Executive Vice-President



J. H. Matthews

J. H. Matthews was appointed executive vice-president of Raybestos-Manhattan, Inc. at a recent meeting of the board of directors. Mr. Matthews was graduated from Stevens Institute of Technology and started with the Manhattan Rubber Mfg. Co. in 1914. He was appointed assistant factory manager of the Manhattan Rubber Division in 1940, became director of the company and assistant general manager of the division in 1942. In 1947 Mr. Matthews was elected a vice-president of Raybestos-Manhattan, Inc. He is also vice-president of the Canadian Raybestos Co., Ltd., Peterborough, Ont., Canada, in charge of the company's Wabash Division at Crawfordsville, Ind., and the new Neenah, Wisc. plant, and a director of the Kentucky Synthetic Rubber Corp.

"Hab-U-Co Hot Grip" Adhesive

"Hab-U-Co Hot Grip", a new thermoplastic adhesive cement from the laboratory of Hadley Bros.-Uhl Co. of St. Louis, Mo., is now on the market for industrial use. This product, proved in service, says the manufacturer, melts to a low viscosity for easy application, and sets rapidly to a tough, permanent but flexible bond. The manufacturer further claims that Hab-U-Co Hot Grip is a dependable adhesive for industrial application where immediate setting is desirable for application to cloth, paper, leather, metal or wood. Samples are available by writing Hadley Bros.-Uhl Co., 514 Calvary Ave., St. Louis 15, Mo., or through their representatives located in various cities.

Chemical Profession Dinner

The annual dinner of the Chemical Profession in Cleveland will be held at the Hollenden Hotel in that city on November 11. This is the fifth annual dinner, jointly sponsored by the Cleveland sections of the American Chemical Society, Alpha Chi Sigma, the American Institute of Chemists, the Electrochemical Society, and the American Institute of Chemical Engineers. Principal speaker of the evening will be Professor Harold C. Urey of the Institute of Nuclear Studies, University of Chicago, who will speak on "Cosmic Chemical Engineering."

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A Word About the Author—

Dr. Royce J. Noble is a well-known consulting chemical engineer and an outstanding expert on latex. He has been intimately associated with latex technology for the past 30 years and has served with one of the leading suppliers of latex compounds and compositions in a technical and executive capacity. During World War II he was associated with the Chemical Warfare Service as a Colonel engaged in both rubber and latex problems. He is eminently qualified as the author of this comprehensive text bok on latex and its applications.

●

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Appointed Goodyear Secretary

A change in the official organization personnel of Goodyear Tire & Rubber Co. places Arden E. Firestone, attorney and assistant secretary of foreign operations, in the post of secretary of the company. W. D. Shilts, who has been secretary of Goodyear for the past 27 years, is relinquishing the office at his own request and will continue with the organization in fields of special assignments. Mr. Firestone, a graduate of Akron University, received his law training at the University of Michigan, from which he obtained his jurist doctor's degree. He was a partner in the Akron law firm, Hutchinson and Firestone, from 1932 to 1942, when he joined Goodyear as an attorney in the Law Department. He was appointed assistant secretary of the company's Foreign Operations in 1947. A member of the Akron and Ohio State Bar Associations, Mr. Firestone also holds membership in the Akron City and Kiwanis Clubs, and Phi Delta Theta fraternity. In World War II, from April, 1944 to February, 1946, he served with the Navy as lieutenant in the Pacific Theater.

Mr. Shilts joined Goodyear's sales organization in 1905, following graduation from Mt. Union College. He was elected assistant secretary of the company in 1919 and secretary in 1926. During World War I, Mr. Shilts headed the Liberty Loan Campaigns in Akron and Summit County. He organized the first War Chest program then and was president of the United War Chest of Summit County during World War II. Mr. Shilts is a trustee of Western Reserve Academy there, as well as of Mt. Union College.

RMA Holds Golf Tournament

The executive staff of the Rubber Manufacturers Association held its third annual golf tournament recently at the Westchester Hills Country Club. George Flint, chairman of the Tire Division, and R. R. Ormsby, vice-president, won top awards in the tournament. Mr. Flint won the low gross event, while Mr. Ormsby won low net. C. P. McFadden, chairman of the Footwear Division, was runner-up for low gross, while J. J. Catterall, chairman of the Mechanical Goods Division, was runner-up for low net. W. J. Sears, vice-president, and Charles C. Miller, public relations director, ran first and second in the "kicker" contest. In the accuracy contest, first and second went to Richard E. Vernor of the Washington staff and George D. Freestone, assistant treasurer.

Witco Buys New Facilities

Witco Chemical Co., New York, N. Y., recently purchased plant facilities in the Los Angeles, Calif., area and plans to install manufacturing equipment in the near future. This expansion of the company's present production facilities has been undertaken to supply the Pacific Coast area locally instead of meeting requirements by shipments from distant plants. The company reports that increasing sales of its products on the West Coast has made this a logical development in its expanding manufacturing program.

WHO MAKES IT?

From time-to-time inquiries are received requesting sources of supply or information on specific items. Among inquiries received of late are the following:

(1) Who manufactures the Miller Stretchometer?

(2) Who produces replicas of wild animals in rubber, 8 to 16 inches in size? The replicas should be suitable for kindergarten instruction.

Persons or companies having information on these items are requested to communicate with us and we will forward the information to the original inquirers.

EDITOR

Kiel Named Chief Chemist

E. W. Kiel has been named chief chemist of the Goodyear Tire & Rubber Co. plant in Gadsden, Ala. Mr. Kiel moves to Gadsden from Jackson, Mich. where he has been replaced as chief chemist of Goodyear's plant by M. G. Atkinson. Mr. Kiel joined Goodyear as a factory office trainee in Akron in 1941. He subsequently served in Akron as physical laboratory operator and junior development compounder before moving to Gadsden in 1947 as development section head. He was transferred to Jackson as chief chemist in 1948. Born in Cottonwood, S. D., he was graduated from South Dakota School of Mines with a bachelor of science degree in chemical engineering. Mr. Atkinson spent his entire Goodyear career at Jackson since joining the company in 1937. He has held a number of important chemical assignments and in 1946 was promoted to compounder, serving in that capacity until taking over his new duties as chief chemist. Mr. Atkinson was graduated from Michigan State College with a bachelor of science degree in chemistry.

Appoints New Vice-Presidents

Sun Rubber Co., Barberton, Ohio, has announced the appointment of Willard T. Davis as vice-president and factory manager. Mr. Davis attended the University of Akron and then was with the Goodyear Tire & Rubber Co. for 12 years. Mr. Davis then joined the General Aniline & Film Corp., where he remained until his most recent appointment. The company has also announced that Walter S. Raymer, Jr., formerly assistant secretary and assistant treasurer, has been promoted to vice-president and controller. Mr. Raymer has been associated with the company for the past 15 years. Prior to that time, he was associated with the B. F. Goodrich Co. He is a former president of the Akron Chapter of the National Cost Accountant and the Akron Credit Men's Association. He has also served as lieutenant governor of Kiwanis International.

Offers Computation Services

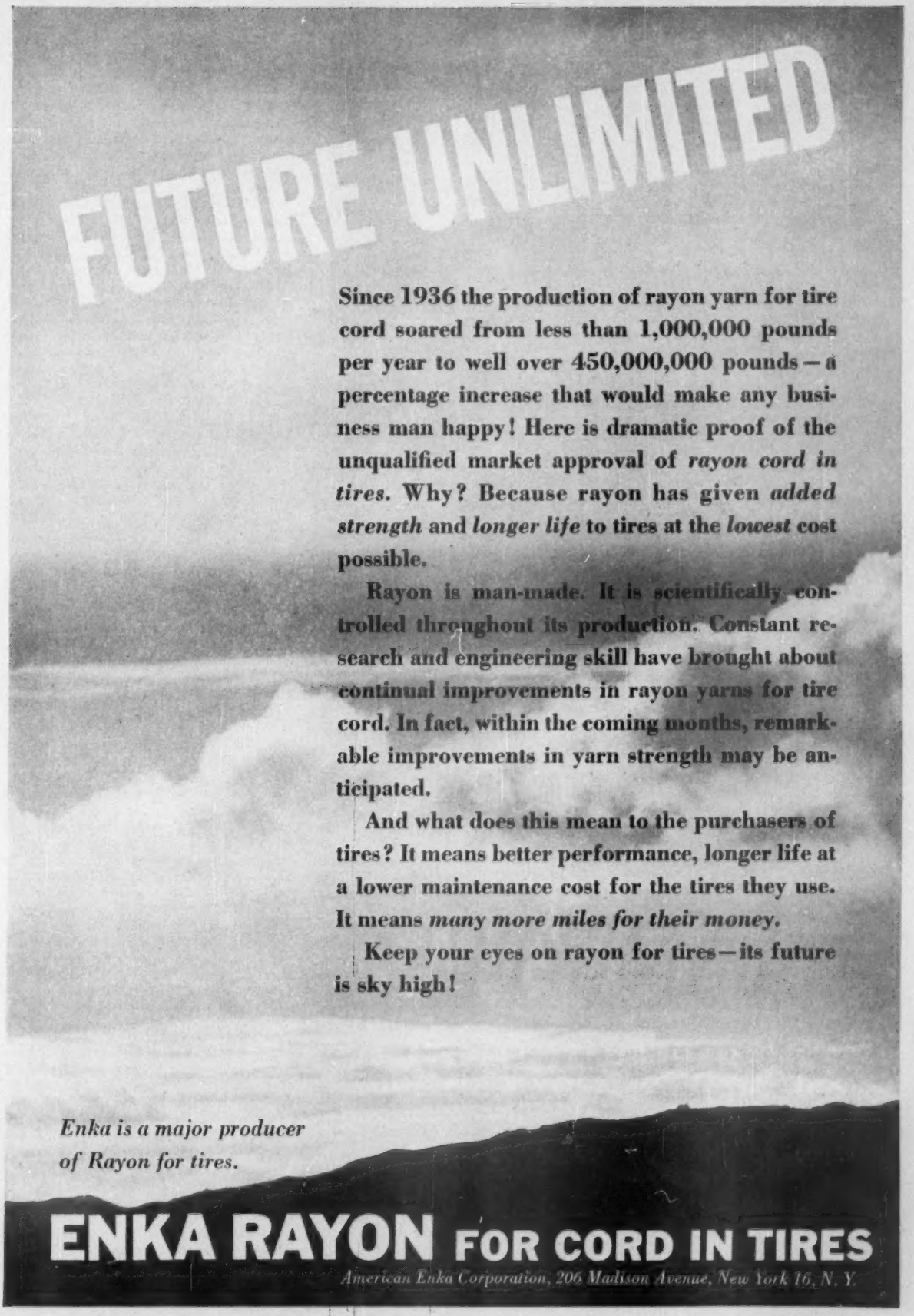
High-speed computation services, performed automatically on the Burroughs Laboratory Computer—Model I, are now available to business, manufacturing, trade and scientific organizations at the Research Center of the Burroughs Corp., 511 N. Broad St., Philadelphia 23, Penna. Developed and improved over the last two years for laboratory study, this electronic digital computer has been proven on a regular schedule of computations originating primarily within the Burroughs Research organization. Test problems for outside organizations have included turbo-engine design and performance calculations; pipe stresses for chemical processing plants; optical ray tracing; antenna calculations; and statistical correlations. An expanded programming staff now permits the handling of exploratory problems for other business, manufacturing, trade and scientific groups which wish to evaluate the use of electronic digital computers. General features of the Burroughs Laboratory Computer include: magnetic drum memory systems; punched paper tape input and output facilities, including photoelectric read-in; and extensive checking circuits to avoid error. The computer is largely made up of more than 750 standard electronic building blocks, known as Burroughs Pulse Control Units, which are widely used as test equipment in electronic research on computers. The time required for an addition in the computer is 17/1000 of a second (.017); for multiplication, 50/1000 of a second (.050).

Hacker Named Zwick Agent

William J. Hacker & Co., Inc. of 82 Beaver St., New York 5, N. Y., has been named U. S. representative for Zwick & Co. K. G., Einsingen Bei Ulm-Donau, Germany, one of the oldest manufacturers of material testing equipment on the Continent. Zwick is currently offering a complete line for the testing of rubber and other materials including a resilience tester, punch presses for the preparation of rubber ring specimens, a hardness tester, testing stand, calibrating instrument, tensile testing machine, a foam rubber testing machine and an abrasion testing machine. All the units are said to conform to the specifications called for by A.S.T.M. Additional information on these testing units may be obtained from the Hacker company.

Huber Corp. Promotes Two

Robert B. Takewell, vice-president in charge of the Carbon Black Division, J. M. Huber Corp., has been appointed executive vice-president of the corporation, and A. Z. Hahn has been named vice-president of the Carbon Black Division. Mr. Takewell, who has been with the Huber Corp. for more than 25 years, will be in charge of and coordinate the programs of the Carbon Black, Clay, Ink and Chemical Divisions of the Huber Corp. Both Mr. Takewell and Mr. Hahn will continue to have their offices at Borger, Texas, the headquarters of the Carbon Black and Oil and Gas Divisions. Mr. Hahn has been with J. M. Huber for about five years.


FUTURE UNLIMITED
Since 1936 the production of rayon yarn for tire cord soared from less than 1,000,000 pounds per year to well over 450,000,000 pounds—a percentage increase that would make any business man happy! Here is dramatic proof of the unqualified market approval of *rayon cord in tires.* Why? Because rayon has given *added strength* and *longer life* to tires at the *lowest* cost possible.
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Goodyear ZP5K Airship

According to recent reports, defense perimeters of the United States will be strengthened in the near future with the addition of the Goodyear ZP5K airship to the anti-submarine warfare team of the U. S. Navy. A prototype of the airship is now being built at the Goodyear Aircraft Corp. in Akron, Ohio. Although in the "K"-type classification, the ZP5K is a designed planned replacement for previous "K"-type airships. The ZP5K is equipped with the latest developments adaptable to such aircraft for the purpose of detecting, locating and attacking enemy submarines in the event of future war. The airship can refuel in flight from surface craft, and reballast by a water pickup system while underway. The blimp's envelope will be made of neoprene coated cotton. Power plants will comprise two radial air-cooled engines, conventionally mounted on outriggers. Both engines will be accessible for repair and service while in flight, if necessary. The airship will be manned by a crew of eight officers and men. Landing gear will consist of a single main wheel, fully retractable with tire, of ten-ply nylon construction. Principal construction of the airship car utilizes "Bondolite," a trademarked Goodyear Aircraft product consisting of aluminum alloy sheet forming a lightweight structural sandwich with aluminum foil core. An undisclosed number of the airships will be built.

Dutch Rubber Plant Rebuilt

N. V. Vereenigde Nederlandsche Rubberfabrieken, one of the largest manufacturers of rubber goods in the Netherlands, has completed its reconstruction program brought about as an aftermath of World War II. The works, which are situated at Heveadorp, were about 80% destroyed during the war. The reconstruction program has been coupled with a program of modernization and an extension of facilities. A new factory has been built at Raalte for the manufacture of linen shoes and slippers with sponge rubber soles. The rebuilt works at Heveadorp are producing tires and tubes for bicycles, motorcycles, etc., and rubber articles for industrial and household use as well as rubber footwear. The company presently employs over 1,800 persons. R. N. Meijer and J. Warners, managing directors of the firm, recently celebrated their 25th and 40th anniversaries, respectively, with the concern. K. P. van der Mandele, president of the board, delivered an address at special ceremonies marking the occasion.

Gillette Super-Ribbed Tire

A new highway truck tire called the "Gillette Super-Ribbed", which has variable grooves and ribs that help give up to 40% more original ton-miles of wear, has been announced by the Gillette Tires Division of the U.S. Rubber Co. The new tire has a patented air cooled shoulder design to dissipate excess heat. Groove cracking is virtually eliminated by infra-red curing, and the tire has extra depth tread and two special shock pads to cushion against road shocks, the company said.

Two Join Binney & Smith

Lloyd D. Treleaven

Alden Davis, formerly associated with the Dunlop Tire & Rubber Co., has joined the Akron staff of the Binney & Smith Co., while Lloyd D. Treleaven, previously associated with the Goodyear Tire & Rubber Co., has joined the Technical Service Department at the company's New York office. The addition of Mr. Davis to the Akron staff will give wider technical coverage to the midwest area, the company stated. Mr. Davis was graduated from Union College in Schenectady, N. Y., and served as a research chemist with Dunlop Rubber. Mr. Treleaven was graduated from Ohio State University in 1946, and was formerly chief chemist at Goodyear's Topeka, Kans., plant.

New Synthetic Road Compound

According to a recent report, the University of Kentucky has found that a new synthetic latex compound has a longer life expectancy in roads than a conventional asphalt. The University's conclusion is based upon the discovery by the Firestone Tire & Rubber Co. of a low-cost latex compound different from any rubber heretofore used in asphalt road tests. Firestone is sponsoring a program of research on rubber roads at the University. The new compound is said to be more resistant to frost damage. The surface is said to be less brittle and will not break up under traffic stress as rapidly as ordinary asphalt. Also, the rubber is more evenly distributed in the asphalt itself, and it enables the asphalt mixture to be mixed at higher temperatures without damage from overheating. The flexibility of the rubberized material is said to be greater at the outset and this flexibility is retained to much greater ages.

DuPont Staff Reassignments

The Rubber Chemicals Division of the Organic Chemicals Department, E. I du Pont de Nemours & Co., Inc., has announced a number of reassignments of personnel. Mortimer A. Youker has been transferred to the Rubber Laboratory as a salesman in training on isocyanates as has Robert A. Hammond. Ralph S. Graff has been assigned as neoprene and rubber chemicals salesman for the Wilmington district succeeding Dr. Youker.

Three Join Cabot Research

Godfrey L. Cabot, Inc., Boston, Mass. has announced that Hertha Bienes, Gregory Berstein and Thomas H. Goodgame have recently joined the staff of the Research and Development Department in Cambridge, Massachusetts. Miss Hertha Bienes, Fundamental Research Section, received the degree of B.A. from Hunter College, New York, in 1951, and following graduation became research assistant at Amherst College, Amherst, Mass., specializing in adsorption studies. Thomas H. Goodgame, Applied Research Section, received the degree of B.S. in Chemical Engineering in 1942 from Louisiana Polytechnic Institute, Ruston, La.; the degree of M.S. in Chemical Engineering in 1947 from Louisiana State University, Baton Rouge, La.; and has completed three years of graduate study at Massachusetts Institute of Technology, Cambridge, Mass. Gregory Berstein, senior chemist in the Pigments Application Group, was graduated in Industrial Chemistry from the Technical University, Vienna, Austria, in 1932. Mr. Berstein has been for the past 11 years actively engaged in the New England paint manufacturing industry as a chief chemist. He is a member of the New England Paint & Varnish Production Club.

New Esso Unit Formed

Formation of a major new unit at the Linden, N. J., refinery of the Esso Standard Oil Co. was recently announced. The new unit was designated the Technical Department and has tagen over the functions of several other units. The Technical Department is responsible for all laboratory, mechanical engineering, process engineering, economic study, cost analysis, metal inspection and other technical work at the refinery. The new division will be responsible for contacts with the East Coast Technical Service Division, the Standard Oil Development Co. and other engineering and technical organizations and will coordinate engineering work performed by others for the Bayonne, N. J., refinery. A new Process Engineering Division has been established as one of the units of the Technical Department. It will be responsible for process design, economic study, and process and test service work formerly performed by the Operations Analysis Department and by technical assistants in the process department groups.

Laboratory Adds New Personnel

Nine technical men have recently been added to the staff of the general laboratories of U. S. Rubber Co. at Passaic, N. J. They are: Frederick S. Dovell. B. S., University of Michigan; Arnold N. Johnson, Ph.D., Polytechnic Institute of Brooklyn; Henry F. Miller, M.S. in mechanical engineering, University of Michigan; Edward C. Smith, B.S. in electrical engineering, Massachusetts Institute of Technology; Charles W. Benjamin, B.S., Oberlin College; John Burkus, Ph.D., Duke University; Richard J. Farrell, B. Ch. E., Massachusetts Institute of Technology; and Theodore Shevcov, B.S., University of North Carolina.

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General Latex Personnel

General Latex & Chemical Corp., Cambridge, Mass., has announced a number of personnel additions. Richard V. Does has joined the executive staff as sales administrative assistant. Mr. Does is a graduate of the Massachusetts Institute of Technology in chemical engineering. From 1942 to 1947 he served with the Office of Rubber Reserve of the Reconstruction Finance Corporation, and in 1947 joined the Charles T. Wilson Co. as a technical sales representative. From 1950 until his new appointment, he was associated with Wild & Stevens, Inc., and the research laboratories of Godfrey L. Cabot, Inc. Donald F. Walker has joined the executive staff of the company as laboratory manager. He is a graduate of the University of Toronto with a degree in chemical engineering. He became associated with Dunlop Rubber at Toronto in 1935. From 1935 to 1949 he was actively engaged in foam latex work, both in factory control and development of foamed latex processes. Since coming to this country from Canada in 1949, Mr. Walker has had varied and intimate practical experience in foam latex during the period of its recent rapid development. In other appointments, Frank D. Andruss, formerly sales manager of the company, was named vice-president in charge of sales. The company has also announced that Dr. Royce J. Noble, consultant and author of "Latex in Industry", has joined the company as a consultant on latex matters. Dr. Noble has been associated with the latex industry for many years and has served as a consulting engineer in the technology of rubber and latex since 1931.

U. S. Rubber Promotes Fordham

Alton D. Fordham has been named assistant production manager of the Footwear and General Products Division of the U. S. Rubber Co. In his new capacity Mr. Fordham will be responsible for manufacturing activities in the division's plants at Mishawaka, Ind., Washington, Ind., Stoughton, Wisc., Milan, Tenn., and Chicago, Ill. He will make his headquarters at the Mishawaka plant. Mr. Fordham, who has been general superintendent of a variety of products in the Mishawaka plant since December 1, 1950, started with the company in January, 1937, in charge of office planning. In October, 1941, he was appointed office manager of the Mishawaka plant and was later given added responsibility of customer service and management engineering.

NAWMD Plans Fall Meeting

A tentative program for the Fall Meeting of the National Association of Waste Material Dealers, Inc., to be held November 13 to 18 at the Hollywood Beach Hotel, Hollywood, Fla., was recently announced. The Scrap Rubber and Plastics Institute will meet on Wednesday morning, November 18. A full program of entertainment for attending members and their families has been planned, featuring a banquet, sporting events, sightseeing tours, etc.

Named Lock Thread President

Dr. M. C. Teague has been appointed president of the Lock Thread Corp., Detroit, Mich. Dr. Teague's appointment is effective immediately. He will make his headquarters in Detroit. Dr. Teague succeeds Samuel J. Metzger, Jr., who will continue as a director of the corporation, and brings to his new position a broad engineering background. For the past 33 years, Dr. Teague has been associated with the U. S. Rubber Co. in the development, licensing and sale of new products. Beginning in 1920 as a research chemist in the General Development Department, he later served as a sales manager for Naugatuck Chemical. In 1936 he was named director of the New Products Development Department. In 1944, Dr. Teague was named manager of the Luvon Elastic Fabric Department, a position he held until 1950. For the past three years, he has been in charge of extensive developments in the use of latex in the Footwear and General Products Division of U. S. Rubber. Dr. Teague holds many patents on materials and products which he developed.

Cryogenic Engineering Laboratory

A major low-temperature engineering facility, consisting of a liquid-hydrogen plant and a cryogenic laboratory, has been placed in operation at the National Bureau of Standards site at Boulder, Colo. Known as the NBS-AEC Cryogenic Engineering Laboratory, the $3,500,000 installation makes possible large-scale production of liquefied gases which have not previously been available in sufficient quantity for laboratory and industrial development and testing. The laboratories were designed in cooperation with the Atomic Energy Commission to provide facilities needed for the development and evaluation of cryogenic equipment for use at temperatures near absolute zero. The NBS' long-standing program of fundamental research on the properties of liquid helium, superconductivity, second sound, paramagnetism, and other phases of low-temperature physics remains at the NBS Washington laboratories.

Synthetic Fats Evaluated

New, synthetic fats, acetoglycerides—acetostearins and aceto-oleins, made by chemically substituting acetic acids for longer chain fatty acids in glycerides or natural fats—have been evaluated as secondary plasticizers for a vinyl resin in screening tests conducted at the Southern Regional Research Laboratory of the Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture. Eight acetoglycerides, or mixtures of acetoglycerides, representing different degrees of acetylation, free hydroxyl, and unsaturation were tested as the secondary plasticizers in preparing sheets of a polyvinyl chloride-polyvinyl acetate copolymer, with di-2-ethylhexyl phthalate, tricresyl phosphate, Santicizer 141, and dioctyl sebacate as the primary plasticizers. Use of the fats with the first three plasticizers improved one or more plasticizing qualities, especially when tricresyl phosphate was the primary plasticizer. The fats should prove to be suitable extenders for dioctyl sebacate, the Bureau reported. Acetoglycerides are being produced, in cooperation with the Bureau, by a commercial company on a pilot plant scale to obtain samples for evaluation. Many more evaluations of the acetoglycerides as plasticizers should be made to obtain more precise information on the effects of unsaturation, polyunsaturation, and the degree of acetylation upon their plasticizing characteristics for vinyl resin, and to determine their potentialities for plasticizing other resins, the Bureau states.

Dewey & Almy Appoints Three

Dewey and Almy Chemical Co. has announced that its Container Division is adding three salesmen — Frederick M. Byerly, who will assist in sales of cap and industrial sealing compounds; Edward J. McKearney, who will work with can sealing compounds; Robert C. Dewey, who will take the division's sales training course. Mr. Byerly, a 1942 graduate of Brown University and a World War II first lieutenant in the Marine Corps, was formerly a salesman for Unexcelled Chemical Corp. and the Eagle-Picher Co. in New York. An ensign in the Navy during the war, Mr. McKearney was formerly with the Connecticut Hard Rubber Co.; he is a 1947 graduate of Harvard College Mr. Dewey, a B. S. graduate of Babson Institute in 1951 was recently discharged from the Marine Corps in which he was a first lieutenant.

Opens New Sales Office

Formation of a new Chemical Division sales office in Portland, Ore., has been announced by the Goodyear Tire & Rubber Co. The new sales outlet will be headed by Roy Williams who will cover the Pacific Northwest territory, including Washington, Montana and Idaho in addition to Oregon. Mr. Williams has considerable experience in masonry coatings, paper coatings and impregnates, the company said. He joined Goodyear early this year and completed an extensive training course in Akron.

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Seiberling Promotes Three

Daniel R. Buzzard has been promoted to manager of merchandise distribution for the Seiberling Rubber Co., succeeding Oliver H. Wolcott who retired September 1. Both Mr. Buzzard and Mr. Wolcott are veterans of the Seiberling organization. When F. A. Seiberling founded the company in 1921, Mr. Wolcott set up the Merchandise Distribution Department and Mr. Buzzard became assistant manager a few weeks later. Jesse H. Bert, an employee in merchandise distribution for the last 17 years, moves up as assistant manager of the department. Mr. Buzzard, a graduate of Heidelberg Commercial College, is active in civic work in Barberton, Ohio, where he lives. He is president of the United Fund board of trustees and serves on the board of elders of the First Presbyterian Church. He also is a member and past president of the Barberton Kiwanis Club, past Master of Masonic Lodge 568 and served a two-year term as city councilman. Mr. Wolcott is well known for his rare stamp and envelope collections and for his knowledge of American history. Among his prized awards is the Hanford trophy, awarded by the Garfield-Perry Stamp Club, Cleveland, Ohio, for "excellent service to philately." Mr. Wolcott also is a director and vice president of the Summit County Historical Society, past president of Barberton Rotary Club and active in the Collectors Club of Akron, Rubber City Stamp Club and Ohio State Archaeological Society. Mr. Bert joined Seiberling in 1936 after completing studies in bookkeeping and accounting at the Barberton School of Commerce. A World War II veteran, he is a member of the Elks and Eagles Clubs and has served as a Junior Achievement advisor.

Shell Announces New Plant

A substantial addition to America's supply of glycerine and Epon resins will result from a new plant to be erected at Norco, La., according to a recent announcement by the Shell Chemical Corp. With construction starting immediately and completion scheduled for late 1954, the new plant will produce allyl chloride and epichlorohydrin. Its output will be used to increase Shell Chemical's glycerine production by 24,000,000 pounds per year, and to make available substantial additional quantities of epichlorohydrin and Epon resins. It is the first step in Shell Chemical's current glycerine expansion program. The Norco plant, an entirely new site for Shell Chemical, is designed to operate in conjunction with the Shell Oil refinery there and will use propylene and other feed stocks it produces. Employing about 150 workers initially, it is expected to play a major part in the continuing growth of the New Orleans industrial area.

Foster D. Snell, Inc., New York, N. Y., has made available its newly-revised booklet entitled, "Snell Packaged Unit Spray Dryers."

Man-Made Fibers Up 400%

Consumption of man-made fibers increased four-fold between 1937 and 1951, according to a study of textile inter-fiber composition compiled by E. I. du Pont de Nemours & Co., Inc., and released by the Textile Economics Bureau. Consumption of both natural and man-made textile fibers was 6,377,000,000 pounds in 1951, 35% more than in 1937. In the 15-year period the end-use consumption of man-made fibers increased 993,000,000 pounds, or nearly 400%, while the combined gain for cotton, wool, silk and linen was 669,000,000 pounds, or 15%. Trade estimates of consumption from 1951 to date would indicate that the man-made fibers have maintained their gains in the last 2 years. The DuPont study, it was noted, does not project the end-use figures beyond 1951 nor does it take into consideration the rapid growth of non-cellulosic fibers such as nylon, Orlon, Dacron, Dynel, Acrilan and Vicara since 1951.

NAWMD Plans Scrap Seminar

Scrap rubber, plastics and other commodities will be discussed at a seminar for salvage and disposal officers and personnel which is to be presented in cooperation with the U. S. Army, the National Association of Waste Material Dealers, Inc., recently announced. The seminar will be held at the Palmer House in Chicago, Ill., on September 14 through 18, and NAWMD's portion of the seminar will be the first three days. On September 16, the third day of the gathering, the industrial importance of scrap rubber will be the topic of a lecture by Milton A. Kushkin of A. Schulman, Inc. Following a discussion period, there will be a showing of a film on rubber scrap. Mr. Kushkin will also discuss plastics scrap. NAWMD has stated that the salvage seminars are designed to acquaint Army officials with the importance and basic functions of scrap firms in order to advance a better understanding between the Army and the industry for the proper utilization of scrap.

Griptex Heat-Resistant Cement

Adhesive Products Corp., New York, N. Y., has announced the development of "No. 994 Griptex," a strong- heat-resistant cement for adhering sandpaper to metal or wood sanding discs. The company claims that with the new cement, sanding discs need not be removed individually, but can be cemented one on top of the other until six or eight discs have accumulated, at which time all are easily removed at one time. When sanding hard wood, the heat generated does not tend to make the cement sticky, Adhesive Products states.

Offers New Styrene Process

Scientific Design Co., 2 Park Ave., New York 16, N. Y., has announced the availability of a new and improved monomeric styrene process for the synthetic rubber and chemical industries. The new process follows the same basic chemistry as is now employed by the principal producers, but it represents a number of improvements, the company states, which were not found in styrene plants built during the war: (1) Reduced capital investment together with elimination of the over-capacity of certain sections which were characteristic of many of the earlier plants; (2) maximum yields from benzene and ethylene; (3) adaptation of the process to permit use of low-grade or impure ethylene; (4) improvements in the design and operation of the extensive fractionation columns required; (5) redesign of the dehydrogenation and alkylation reactors to incorporate the most recent advances in materials and conceptions; (6) incorporation of many individual features designed to still further simplify operations. The company states that four years of development work and the design of a commercial plant lie behind this improved process. It is also said to include the experience of one of the major European producers of this valuable chemical. The Scientific Design Co. has also designed a new plant employing a process similar to a part of the styrene process, for the manufacture of cumene of exceptionally high purity.

Buys Wire Insulating Machinery

Machinery Electrification, Inc., Worcester, Mass., has purchased Wire Insulating Machinery, Inc. of Manchester, Conn. All of the Wire Insulating facilities have been moved to Worcester, and the firm will continue operations there as a subsidiary of Machinery Electrification. Harold H. Duff will continue as manager of Wire Insulating Machinery. Frank Bonneau has been added to the organization as chief engineer, and the full engineering and development facilities of Machinery Electrification, Inc. have been made available to its subsidiary. The parent company develops and manufactures electrical control equipment and specializes in the application of power and control to machinery. Wire Insulating Machinery designs and manufactures standard and special wire processing equipment, among which is an electronically controlled, fully-automatic continuous coiler and re-spooler.

Everedy Plans Expansion Program

Everedy Latex & Plastics Corp., Brooklyn, N. Y., manufacturers of latex dollskins, has announced a new expansion program. A new balcony has been added throughout the main plant, while a nearby building has been acquired for inventory purposes. The company has also purchased additional acreage for the purpose of constructing additional space. Company officials stated that a vinyl research program is now under way and that the firm shortly expects to announce new vinyl products bearing the Everedy trademark.

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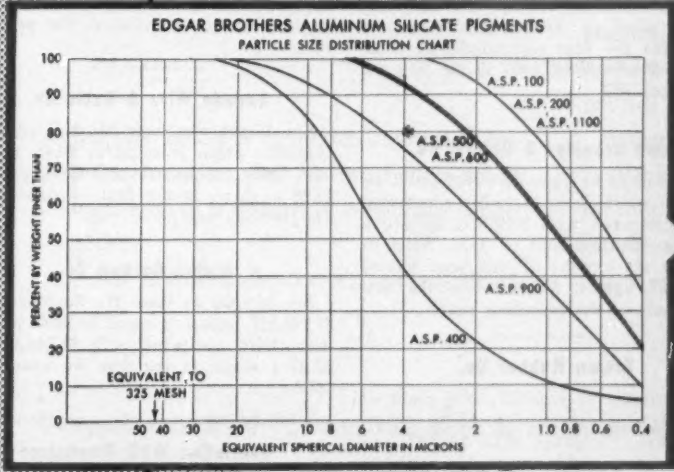

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FINANCIAL NEWS

Goodyear Tire & Rubber Co.

Six Months to June 30: Net income of $22,997,684, which is equal to $4.92 a common share, compared with $15,480,369, or $3.21 per share, in the first six months of the previous year. Consolidated net sales in the first half of 1953 totaled $616,315,503, a gain of $47,482,148, or 8.3%, over sales of $568,833,355 reported for the first half of 1952. Working capital at mid-year was $392,104,385, with the ratio of current assets to current liabilities standing at 4.7 to 1.

Seiberling Rubber Co.

Six Months to June 30: Net profit of $525,337, which is equal to $1.07 each on 391,200 shares, compared with $437,137, or $1.08 each on 301,010 shares, in the first six months of 1952. Net sales for the six month period ending June 30, 1953 were $20,911,260, contrasted with $19,641,935 in the first half of last year.

National Motor Bearing Co.

Six Months to June 30: Net profit of $434,504, which is equal to $1.02 a share, compared with $368,305, or 87c a share, in the first six months of 1952. Sales in the first half of 1953 amounted to $9,701,473, contrasted with $8,626,566 in the first half of the preceding year.

Parker Appliance Co.

Year Ended June 30: Net profit of $1,014,306, which is equal to $2.62 a share, compared with $834,257, or $2.15 a share, in the preceding fiscal year. Sales in the 1953 fiscal year amounted to $22,072,170, against $21,879,316 in the year ended June 30, 1952.

Anaconda Wire & Cable Co.

Six Months to June 30: Net profit of $3,602,231, which is equal to $4.27 a common share, compared with $3,092,344, or $3.66 a share, in the first six months of the preceding year.

Columbian Carbon Co.

Six Months to June 30: Net income of $2,593,173, which is equal to $1.61 a common share, compared with $2,127,847, or $1.32 a share, in the first six months of the preceding year.

Cooper Tire & Rubber Co.

Six Months to June 30: Net profit of $366,695, which is equal to $2.34 a common share, compared with $164,150, or $1.50 a share, in the comparable period of 1952.

Lea Fabrics, Inc.

Year Ended May 31: Net profit of $560,758, which is equal to $2.67 a share, compared with $453,062, or $2.16 a share, in the preceding fiscal year.

B. F. Goodrich Co.

Six Months to June 30: Net income of $16,874,655, which is equal to $4.03 a common share, compared with $14,905,791, or $3.46 a common share, in the first half of 1952. Consolidated net sales in the first half of 1953 amounted to $350,385,793, against $297,278,822 in the first half of the preceding year. Net working capital increased from $197,031,239 to $205,766,353 during the period from June 30, 1952, to June 30, 1953.

Minnesota Mining & Mfg. Co.

Six Months to June 30: Net profit of $9,056,111, which is equal to $1.09 a share, compared with $7,486,720, or 91c a share, in the six months ended June 30, 1952. Record sales of $106,234,119 were reported for the first six months of 1953, contrasted with $88,074,407 in the first six months of 1952.

Union Asbestos & Rubber Co.

Six Months to June 30: Net profit of $147,576, which is equal to 31c a common share, compared with $387,078, or 81c a share, in the first half of 1952. Sales in the first six months of this year totaled $5,753,327, against $7,390,914 in the first six months of the preceding year.

Brown Rubber Co.

Six Months to June 27: Net profit of $564,538, which is equal to $1.50 a common share, compared with $453,421, or $1.20 a share, in the comparable period of the previous year.

Flintkote Company

Six Months to July 18: Net income of $2,485,764, which is equal to $1.83 a common share, compared with $2,009,375, or $1.45 a share, in the comparable period of 1952.

Philadelphia Insulated Wire Co.

Six Months to June 30: Net profit of $19,745, which is equal to $1.66 each on 11,884 shares. Comparison with the first six months of the previous year is not available.

Baldwin Rubber Co.

Year Ended June 30: Net profit of $928,191, which is equal to $2.14 a common share, compared with $902,697, or $2.08 a share, in the previous fiscal year.

Joseph Dixon Crucible Co.

Six Months to June 30: Net profit of $129,006 on sales of $5,258,551, compared with $23,195 on sales of $4,857,031, in the first six months of 1952.

National Rubber Machinery Co.

Six Months Ended June 30: Net profit of $504,672, which is equal to $2.86 a share, compared with $285,134, or $1.62 a share, in the first six months of the preceding year. Net shipments in the first six months of this year totaled $11,993,002, against $9,236,967 in the first six months of 1952.

Aetna-Standard Engineering Co.

Year Ended June 30: Net income of $923,428, which is equal to $2.40 a common share, compared with $774,285, or $2.11 a share, in the previous fiscal year. Net sales in the 1953 fiscal year amounted to $27,338,685, against $20,520,387 in the year ended June 30, 1952.

Garlock Packing Co.

Six Months to June 30: Net income of $708,316, which is equal to $1.69 a share, compared with $630,780, or $1.50 a share, in the first six months of the previous year.

Canada Wire & Cable Co.

Six Months to June 30: Net profit of $913,000, which is equal to $4.45 a common share, compared with $1,022,000, or $5.08 a share, in the first six months of the previous year.

United Carbon Co.

Six Months to June 30: Net income of $1,945,317, which is equal to $2.44 a common share, compared with $1,749,355, or $2.20 a share, in the first six months of 1952.

Plastoflex MGB Plasticizer

"Plastoflex MGB", a new, non-phthalate primary plasticizer for vinyl chloride resins, has been announced by the Advance Solvents & Chemical Corp. of New York, N. Y. Developed in the Advance research laboratories, Plastoflex MGB has a low volatility and exhibits a very strong solvent action for vinyl resins and imparts high tensile strength and modulus to vinyl compounds. It is also compatible with a great variety of other polymers used in the coating industry, the firm states. Chemically, Plastoflex MGB is a modified polypropylene glycol dibenzoate. In plastisols, the viscosity is obtained and is maintained unchanged for prolonged periods. Interesting rheological properties of plastisols prepared with Plastoflex MGB are also obtained and compare very favorably with plastisols prepared with more expensive plasticizers. Because of the greater hardness of PVC compounds containing Plastoflex MGB as compared with the use of equal quantities of dioctyl phthalate, this new plasticizer should be of special interest to compounders. Test results in certain resins, the company states, show the following advantages over DOP compositions: greater tensile strength; higher modulus of elasticity; higher boiling point; lower vapor pressure; lower volatility and less odor.

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Nitrile Rubber (32% acrylonitrile content)	100	100
Hi-Sil "C"	65	.....
MPC Black	.....	60
Zinc Oxide	5	5
Sulfur	2.0	1.5
MBTS	1.5	1.5
TMTDS	0.5	.....
DPG	.....	0.2
25°C. m.p. Coumarone resin	8	8
Aromatic softener	7	7
Stearic Acid	1.5	1.5

Mins. Cure at 310°F	Modulus 300%	Tensile	Elong.	Duro. Hard. 0"	Duro. Hard. 30"	Tear lbs./inch
Compound A—Hi-Sil "C"						
30	1890	3990	510	78	66	370
45	1740	3830	500	78	67	350
90	2030	4200	490	78	70	430
Compound B—MPC Black						
30	1840	3470	490	72	59	330
45	2100	3720	470	73	60	320
90	2500	3990	430	73	62	310

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"Pyrolock" Coating Material

A new quick-drying material that can be sprayed like paint on metal making the treated surface capable of withstanding temperatures as high as 5000° F. has been developed by the B. F. Goodrich Co. Called "Pyrolock", a one-sixteenth inch coating of the new insulation protects metal for as long as ten seconds against flame temperatures hotter than the melting point of metals. Pyrolock is described as a water base inorganic material unique in the field of thermal insulation. The material was developed at the request of the Defense Department for use in the rocket and guided missile field. Laboratory tests conducted over a two year period indicate that the new material resists higher temperatures for longer periods than any other preparation available for use in that field. Pyrolock is non-toxic, non-flammable, non-explosive and will adhere directly to clean metal surfaces without sandblasting or use of priming surface preparations. The dried layer of Pyrolock bonds itself to metal with a strength that withstands sharp impact short of actual deformation of the base metal. Resistant to most solvents and chemicals, the material also withstands indefinitely temperature cycles of —60° F. to +165° F. Looking toward the potential use of Pyrolock in industry, the company says that the present material can be easily modified for use anywhere where resistance to flame and high temperatures is needed. A modified version of Pyrolock for broader use in industry would provide for adhesion to many types of surfaces, withstanding water, acids, alcohol and the effects of weather.

All Nylon Motorcycle Tire

What is said to be the first American-made all nylon cord tire for motorcycles has been announced by the Goodyear Tire & Rubber Co. Known as the "All Nylon Super Eagle," the new tire is available in one size only, 5.00—16. The company states that the tire offers motorcyclists the maximum in safety and long wear at a price only slightly above conventional tires. Chief advantages of the all nylon cord, Goodyear pointed out, are its inherent lightness and greater flexing strength. These qualities make the tire cooler-running, longer wearing and more durable, thus giving greater protection against blowouts. The new tire has the same skid-resistant tread design as the company's present "Super Eagle" tire for motorcycles.

Planning Courses in Rubber

The College of Engineering of the University of Florida, Gainesville, Fla., has announced plans for the offering of courses in resins, plastics and elastomers in the 1954-55 school year. Enough laboratory and lecture work will be given in these subjects to qualify a student for a master's degree. The course will be under the supervision of Professor Robert B. Bennett.

"Flo-Mix 66" Reclaimed Rubber

A new form of reclaimed rubber which, it is said, will greatly increase the efficiency and speed of many manufacturing processes using rubber has been announced by the U. S. Rubber Reclaiming Co., Buffalo, N. Y. Known as "Flo-Mix 66," the new product is in powdered form and pours like sugar. Its cost, according to the company, will be approximately 10% less per pound than conventional forms of reclaimed rubber. Company officials pointed out that the material is especially suited for use in the tread, sidewalls and between the fabric plies of tires, in battery boxes, molded mechanical goods, footwear, soles and heels, and industrial belting. In some of the manufacturing processes which were tested, Flo-Mix 66 reduced the mixing time appreciably. Company officials predict that the new product will revolutionize many manufacturing operations not only because of its greater efficiency as an element in manufacture, but because of the ease with which it can be handled and shipped. Flo-Mix 66 can be shipped in tank cars and automatically conveyed from the car to the point of use in the customer's plant. It can also be shipped in bags of uniform weight.

Reichhold to Move Offices

Reichhold Chemicals Inc. has announced that the company is moving most of its executive offices from New York City to the new Alexander Smith, Inc. office building in White Plains, N. Y. The move was made in order to combine accounting facilities with the executive offices and to closely co-ordinate management control of over-all operations, a company spokesman said. Officials pointed out that Reichhold will continue to maintain its office in the International Building at 630 Fifth Avenue as a New York sales office. The actual change is expected to be completed by the end of October. Additional plans call for the allocation of space for technical and patent libraries from Detroit and possibly for the entire traffic department.

LOS ANGELES NEWS

Curt Wolters, formerly associated with the California Rubber Products Co., has joined the Pacific Moulded Products Co. Gene Huxley has also joined the latter firm.

Franklin French has joined the Goodyear Rubber Co. of San Francisco, Calif., according to a recent announcement.

Ed Lynch, formerly associated with the Rubber Corporation of California at Garden Grove, has been named chemist at the Master Processing Corp. of Lynwood, Calif.

Jerry Tessier, previously associated with the U. S. Rubber Co. at Milan, Tenn., has been appointed plant superintendent at the Rubber Corporation of California.

1954 Plant Maintenance Show

The Plant Maintenance Show, held for the past four years in the East, will move to Chicago for the 1954 exposition, according to a recent announcement by Clapp & Poliak, Inc., New York, N. Y., producers of the exposition. At the same time, it was disclosed that the name will be changed to the Plant Maintenance & Engineering Show. The exposition will take place at the International Amphitheater, January 25-28, inclusive. The show, first held in 1950, has risen to a position of one of the giants in the industrial exposition field. It will be one of the five largest annual industrial shows to be held anywhere in the country. The Chicago exposition will cover more than 100,000 square feet of exhibit space, about one-third larger than the 1953 show and about six times the size of the first exhibit. Three hundred and ten companies already have been assigned space, and the final total is expected to reach 350. Concurrently with the show, the Plant Maintenance & Engineering Conference will be held at the Hotel Conrad Hilton. For the fourth successive year, the conference broke attendance records for technical sessions of this type, with more than 2,100 in attendance at the 1953 meeting. Advance registration cards may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Nerva-Kote TAE Coatings

The Nerva-Kote Division of the Rubber & Plastics Compound Co., New York, N. Y., has introduced a new type of versatile protection for metallic and non-metallic surfaces. Called "Nerva-Kote TAE" coatings, they are said to offer the same resistance to alkalies, acids and solvents heretofore only available in baked-on systems without the necessity of being baked. They are room temperature cured, and exhibit excellent adhesion to all surfaces, extreme flexibility and exceptionally long life, the company states. Nerva-Kote TAE dries fast and may be recoated in 6 to 8 hours. They are recommended as a protective coating for ducts, machinery, bottle washing and filling equipment, vessels, walls, and tanks. Also, they may be used as a maintenance replacement to baked coatings where heat could not possibly be applied.

Hardman Forms DPR Firm

H. V. Hardman Co., Inc., has announced the formation of its subsidiary corporation, DPR, Inc. This new unit will concentrate on the development, manufacture and sale of depolymerized rubber and its compounds. DPR was made commercially available in 1949 and has found increasing specialty uses. DPR, Inc., is housed in new units adjoining the parent company at 571 Cortlandt St., Belleville, N. J. Additional production space was finished last year and the office area was recently doubled. Henry Pande has joined the new organization as development chemist. Mr. Pande is in charge of the new laboratory which has been equipped especially for continuing work on DPR products.

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giving complete details, with color chips. Write The Glidden Company, Chemicals • Pigments • Metals Division, Union Commerce Building, Cleveland 14, Ohio.

Acquires Condenser Service

Consolidated Products Company, Inc., 15 Park Row, New York, N. Y., has acquired ownership of Condenser Service & Engineering Co., Inc., Hoboken, N. J., and it various affiliated companies, representing assets over $3,000,000, according to a recent announcement by Herman Kahn, president of Consolidated Products Co. Mr. Kahn also reported that William M. Kennedy, former president of Condenser Service, will retain active participation as chairman of the board of directors, and Maurice Grober will continue as general manager of Condenser Service. Personnel of the merged group will be maintained towards better and wider services to the industries which these companies serve. The various affiliated companies of the Condenser Service & Engineering Companies include the Edge Moor Iron Works, Inc., Edge Moor, Delaware, which has the distinction of being the first incorporated company in the first state of the Union. This company with 24 acres on the Delaware River, has 200,000 square feet of modern facilities for ASME coded fabrication. Also included are Scranton Pump Division, Blackburn-Smith Manufacturing Co., Inc., and Instrument Service Co. with plants at Scranton, Penna. and Raritan, N. J. The consolidation of these two companies will make for a greater scope in their services into the fields of design, engineering, fabrication and erection of boilers, surface condensers, evaporators and heat exchangers, for the oil refinery, marine and ship building, petroleum, refrigeration, sewage, power plant, plastics and chemical and process industries.

Adds Rubber Capping to Belts

The Mechanical Goods Division of the U. S. Rubber Co. is adding a tough rubber capping along the edges of conveyor belts used on underground coal equipment to give them longer service life. Field experience has shown that the edges of the underground belts receive extremely severe punishment in coal mining service. Often belt edges will wear through the rubber cover to the inner belt fabric. When this happens, moisture and fine coal particles enter the fabric and cause rapid belt deterioration. The new capping used on the "U.S. Giant" conveyor belts, is an extra layer of rubber of special construction which guards against excessive wear.

Daignault Named Vice-President

Westinghouse Air Brake Co. has created a new office of vice-president in charge of finance and elected Alexander T. Daignault to the post, effective as of September 1. Mr. Daignault will resign as treasurer and director of Dewey & Almy Chemical Co. of Cambridge, Mass. He joined that company in 1946 as assistant to the president, became treasurer in 1948 and a director last year. He is also a director of Baird Associates and Control Engineering Corp., both affiliates of the American Research and Development Corp. of Boston, Mass.

CANADIAN NEWS

Viceroy Manufacturing Co., Ltd., announced recently that the right to purchase one additional Class A share at $8.50 for each ten shares had been granted to shareholders of record as of August 31, The company said that the offer was subject only to the granting of supplementary letters patent covering the split of each common share into one Class A share and one Class B share. There were 236,384 shares of each class outstanding before the offer of additional A shares was made. A maximum of 139,978 A shares was to have been available for this subscription because of a reservation made by the directors to limit the extent of the offering. Proceeds of the initial sale, expected to total about $201,000, will be used entirely for corporate purposes without deduction of commission.

Firestone Tire & Rubber Co. of Canada has announced the start of work on a $4,000,000 expansion program at its plant in Hamilton, Ont. The program, which will increase the capacity of the plant, will also include a modernization of all equipment to make production facilities the most modern and scientific in America. The largest part of the investment will be in new equipment which will enable the local factory to turn out tires for everything on wheels. The staff of 1,400 is expected to be increased by 5%.

Plans for a T-shaped extension to the main administration building of the Polymer Corporation, Ltd., has been announced by officials of the Crown company at Sarnia, Ont. Approximate cost is reported to be $300,000. The Foundation Co. of Canada Ltd., Toronto, has been given the contract. Completion date has been set for six or seven months.

O'Sullivan Plans New Plant

O'Sullivan Rubber Corp. has broken ground at Winchester, Va., for a new manufacturing building which represents the first step in a major expansion and improvement program which will involve an expenditure of $900,000 in the next three years. To be built at a cost of $100,000, the new building will house the company's third giant calender as well as additional curing equipment. The over-all expansion plan contemplates stepping up annual production to a range of $12,000,000 to $15,000,000 from the present level of $9,000,000 to $10,000,000. The increase will be approximately two-thirds in the Rubber Division and one-third in the Plastics Division.

Able Rubber Changes Name

Able Rubber Co. of Norwalk, Ohio, has announced a change in its name to the Huron Rubber Co. No changes other than company name were involved, and the company will continue operations from the same address and with the same line of products. P. D. Jones is president of the Huron Rubber Co.

NSC Granted Federal Charter

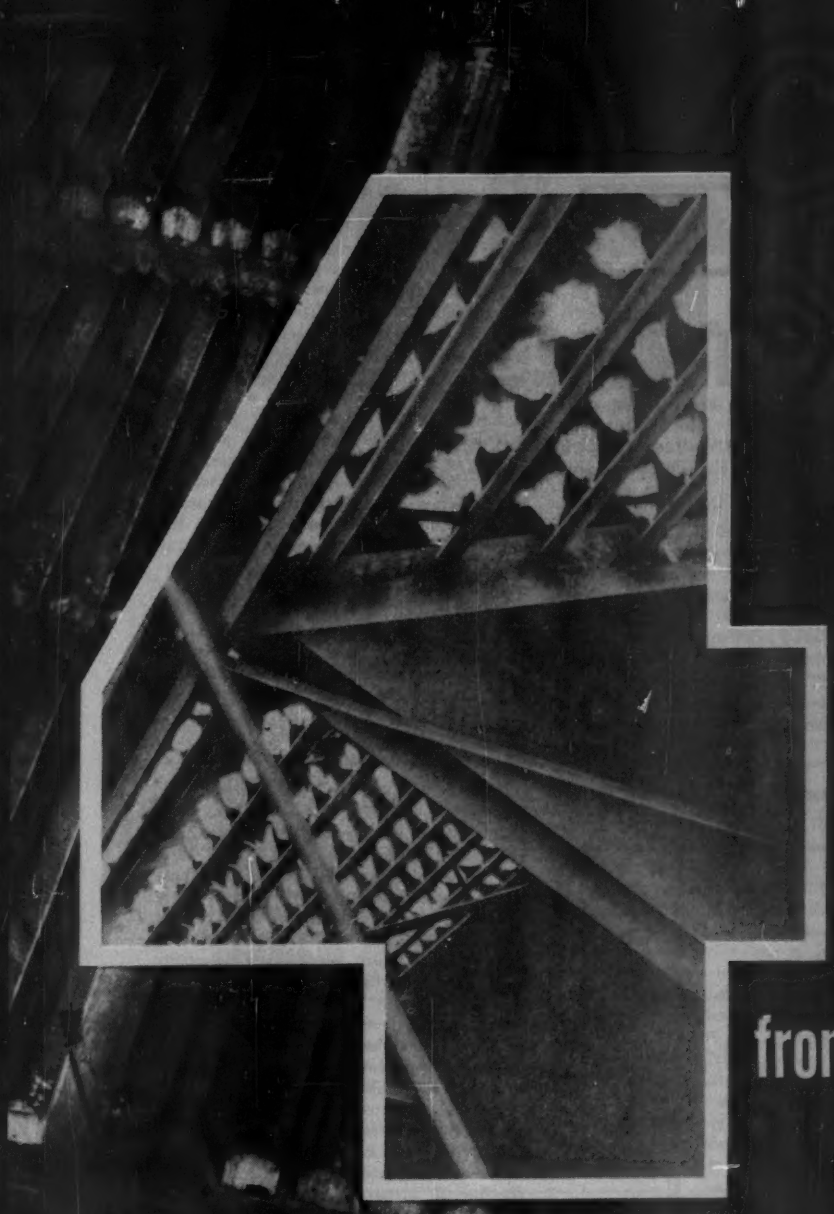
The 11,000 members of the National Safety Council, including the leading industrial concerns of the nation, are being informed of the Council's recent incorporation under a federal charter. The action by Congress and President Eisenhower is regarded as formal recognition by the U. S. government of the Council's leadership and 40 years of activity in combatting the accident problem as a privately financed nonprofit organization. The prestige of a federal charter is now enjoyed by a limited number of public service organizations such as the American Red Cross, the Girl Scouts and the Boy Scouts, as well as leading patriotic groups. Ned H. Dearborn, president of the Council, said the charter means little change in the structure, purposes and activity of the Council. It will continue to be a privately operated and financed membership association. No government funds will be appropriated, and no changes will be made in membership service or dues arrangements. Legally, the transition will involve only the transfer of the Council's assets as an Illinois corporation to the newly authorized federal corporation. Mr. Dearborn hailed the Congressional action as a milestone in the Council's history. "The charter means that the Congress of the United States has examined our efforts and found them good," he said. "But it has even more significance, because it opens wider doors to the future. And it inspires us to work harder than ever to influence the public attitude toward safer living." Formal presentation of the charter will take place at a ceremony to be held during the National Safety Congress and Exposition in Chicago, Ill., the week of October 19-23.

Increasing Tubeless Tire Output

According to a recent announcement, facilities for making tubeless tires will account for more than one-half of a $22,000,000 expansion program planned by the B. F. Goodrich Co. this year. Arthur Kelly, president of the B. F. Goodrich Co. Tire and Equipment Division, said a total of $13,500,000 will be used to expand tire manufacturing plants in Oaks, Penna. and Tuscaloosa, Ala. The company recently completed other major expansions at tire plants in Akron, Ohio, Los Angeles, Calif., and Miami, Okla. Production of tubeless tires is now almost double what it was last year, Mr. Kelly said. More than 2,000,000 tubeless tires have been put on the road since they were first introduced in 1947.

Softseam Foam Rubber Cement

Anchor Adhesives Corp., Flushing, N. Y., has announced the development of "Softseam," an improved foam rubber cement. The product is said to give a permanent bond. Seams remain soft and do not stiffen. Anchor Adhesives states that Softseam reduces labor costs because of exceptionally good brushing qualities which make it easy to apply. Softseam does not leave any depression tack, the company states.



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OBITUARIES

William T. Brown

William T. Brown, president of A. G. Spalding Bros., Inc., Chicopee, Mass., died on August 23 in Springfield Hospital, Springfield, Mass. He was 57 years old. Mr. Brown was elected president of the company in 1952, after having been vice-president for fourteen years. He joined the company in 1919. Born in Rockford, Ill., he was a nephew of A. G. and J. Walter Spalding, founders of the concern. He was a graduate of Yale University and attended the Harvard Graduate School of Business Administration. During World War I, he served as a lieutenant commander in the U. S. Navy. When the war ended, he joined Young & Rubicam, New York advertising concern. Six years after he joined Spalding, he was elected a director, after having served as assistant treasurer and secretary. He became vice-president in charge of manufacturing in 1936, and from that post was elected president. Mr. Brown was president of the Chicopee Manufacturers Association and the Employers Association of Western Massachusetts. He was a vice-president and a member of the Executive Committee of the Associated Industries of Massachusetts and a director of the Third National Bank and Trust Co. of Springfield. Mr. Brown leaves his wife, three sons, and his sister, Mrs. Charles F. Robbins, wife of the chairman of the board of the company.

Myron H. Clark

Myron H. Clark, formerly associated with the U. S. Rubber Co., and long active in labor-management affairs, died on August 30 at Andover, Mass. He was 72 years old. A graduate of the Massachusetts Institute of Technology, Mr. Clark joined U. S. Rubber in 1903 and remained with the company until 1922 at which time he was general manager of the Footwear Division. Mr. Clark was one of the organizers of the Labor-Management Institute at the University of Connecticut. During his career, Mr. Clark established successful labor-management cooperation for U. S. Rubber and the Johns-Manville Corp. He was a member of the American Management Association, the American Association for the Advancement of Science, the Society for the Advancement of Management, the American Academy of Political and Social Science and the Society for the Advancement of Education. He is survived by his wife and two sons.

Charles J. Geilfuss

Charles J. Geilfuss, assistant general manager of the General Asbestos and Rubber Division of Raybestos-Manhattan, Inc., North Charleston, N. C., died unexpectedly on July 30 at his summer home on Sullivan's Island.

Littleton C. Barkley

Littleton C. Barkley, general sales manager of the West Coast Division of Raybestos-Manhattan, Inc., died on August 27 at San Mateo, Calif. He was 51 years old. Mr. Barkley joined the Manhattan Rubber Manufacturing Co. of Passaic, N. J., now the Manhattan Rubber Division of Raybestos-Manhattan, in 1926. Two years later he was transferred to the New York office as a sales representative and was named assistant branch manager in 1937. He later served as manager of the New York branch from 1940 until 1944, when he was appointed sales manager of the Industrial Rubber Products Division at Passaic. In 1948, Mr. Barkley became general sales manager of the West Coast Division of the company, a position he held until his death.

Magnus M. Burgess

Magnus M. Burgess, president of the Sheller Manufacturing Corp. of Portland, Ind., and a director of the E. W. Bliss Co. of Canton, Ohio, died on August 14 at the University of Michigan Hospital, Ann Arbor, Mich. He was 56 years old. Mr. Burgess, a native of Detroit, started his business career with the C. R. Wilson Body Co., which later merged with the Murray Body Corp. and two other automotive enterprises to form the Murray Corp. of America. Mr. Burgess became general manager of this organization. He joined Sheller Manufacturing as general manager in 1929, and in 1932 was elected president, a post he held until his death. Mr. Burgess is survived by his wife and daughter.

David A. Metzler

David A. Metzler, one of the leading figures in the development of reclaimed rubber, died on September 1 in Peoples Hospital in Akron, Ohio. He was 70 years old. Mr. Metzler was general superintendent and factory manager of the old Philadelphia Rubber Co., when he retired in 1938. The company later became part of the B. F. Goodrich Co. Mr. Metzler had also been associated with the old Diamond Rubber Co., which he had joined in 1904. Services were held on September 4 in St. Vincent Church in Akron, with burial in the church cemetery. He leaves his wife and son.

Harry L. Ericson

Harry L. Ericson, chief chemist for the Continental Carbon Co. at Amarillo, Texas, passed away suddenly on August 4. He was 33 years old. Prior to his transfer to Continental Carbon in 1951, Mr. Ericson was associated with the Carbon Black Division of the Witco Chemical Co. for three years, both in New York and Chicago. Funeral services were held in Boston, Mass., on August 8.

Army Cancels Gas Mask Contract

The U. S. Army has announced that it had settled a controversy over where to buy gas masks by buying no gas masks at all. The Army had awarded a contract for gas masks to the Firestone Tire and Rubber Company plant at Fall River, Mass., although the Pennsylvania Rubber Co. of Jeannette, Penna., was the low bidder. Fall River at the time was classed as a more severe unemployment area than Jeannette, and Firestone was given a chance to meet the low bid. Later, Fall River was put in the same classification as Jeannette and Representative Augustine G. Kelley, (Dem. Penna.) protested the contract. The Army, however, held it was binding. Some time later, Controller General Lindsay C. Warren ruled that the contract, which called for 1954-55 deliveries was invalid because it was not based on current requirements. As a result, an Army spokesman said, the whole procurement contract is being dropped and no new bids will be sought.

Amon Returns from Tour

Fred H. Amon, technical director of Godfrey L. Cabot, Inc., Boston, Mass. has just returned from a month's trip to England and Scotland, where he visited various rubber manufacturing firms and held technical discussions with their representatives. He also met with members of the technical and sales staff of Cabot Carbon, Ltd., Cabot British subsidiary company at Stanlow, near Liverpool, England. One of the purposes of Mr. Amon's trip was to discuss recent developments with respect to use of the newer oil furnace blacks in natural rubber. In particular, he was concerned with possibilities for increased applications in British industry of Stanlow-produced Cabot oil furnace blacks, and further diversification of plant production. Cabot Carbon, Ltd. producing highly reinforcing oil furnace blacks since 1950, has recently expanded manufacturing facilities, doubling its production capacity.

Shawinigan Named Revertex Agent

Shawinigan Products Corp., 350 Fifth Ave., New York 1, N. Y., has been appointed exclusive sales agent in the United States for natural rubber latices produced by Revertex, Ltd. of London, England. Among the grades handled will be Standard Revertex, 72% solids, and a prevulcanized latex (V-Revertex), which will air-dry to a vulcanized end product. Stocks of rubber latex in drums are maintained in a warehouse in Brooklyn, N. Y., and larger shipments can be arranged from the Far East.

To Make Copper and Brass Tubing

Triangle Conduit & Cable Co., New Brunswick, N. J., has announced plans to enter the copper and brass tube field. The materials will be manufactured in the company's new mill which covers an area of 130,000 square feet, and production is scheduled to start about October 15. Company policy is to sell exclusively through distributors, who service plumbing and heating contractors, industrials and other types of consumers.

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CIRCOMAR-25 A heavy, viscous, dark liquid softener of the asphalt-flux type.	In the manufacture of tires of natural rubber, GR-S polymers, or blends of these two.
CIRCOMAR-110 A very low-cost soft asphaltum.	In the manufacture of tires.
SUNDEX-53 A low-cost, relatively aromatic product highly compatible with natural rubber and GR-S polymers.	In the manufacture of oil-extended polymers. In the processing of tires, rubber footwear, matting, toys, semihard rubbers, etc. In extending high Mooney viscosity Neoprene WHV.
SUNDEX-41 A complex dark-colored blend of high mol. wt. petroleum fractions and a specially prepared asphaltum, all derived from selected sources.	For processing "cold rubber."
516 RUBBER PROCESS AID A highly paraffinic type product.	In the manufacture of butyl inner tubes.
PDO 40 RECLAIMING AID A dark-colored product composed of polymerized olefinic hydrocarbons generally cyclic in character.	As a reclaiming agent.
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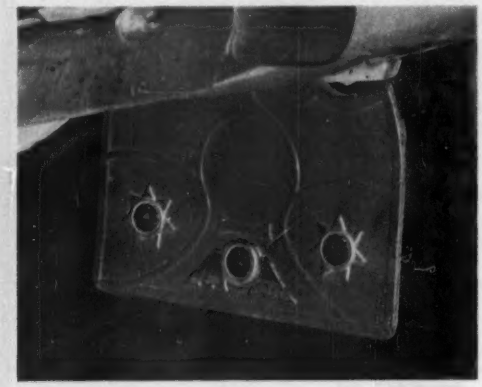
NEW GOODS

Colored Auto Fender Flaps

Tingley Rubber Corp. of Rahway, N. J., has introduced a new line of automobile fender flaps permanently colored in pastel shades of red, green and blue. Made of all-new rubber, the flaps feature a quadrant-type "vice-jaw" clamp that fits any fender and never comes loose, the company states. Made of spring steel, it is



claimed that this clamp is so well engineered it can be permanently tightened with a dime. Once adjusted, it always hangs in the same position. Tingley Rubber is also making bicycle flaps in the same colors as the automobile fender flaps. The flaps are ornamented with ruby-red plastic jewels and chrome-zinc which will not rust.

Ironsides Utility Hose

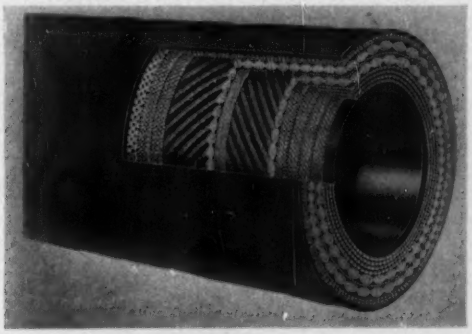
A new, wire-reinforced utility hose, "Ironsides Utility Hose," has been developed by the Quaker Rubber Corp., a division of the H. K. Porter Co., Philadelphia, Penna. Designed especially for multi-purpose work, where extreme flexibility and resistance to high pressure is required, the unit can be used as an air hose, oil hose, water hose, gasoline hose, spray hose, and even for hydraulic lines at working pressures as high as 1,500 psi, the company states. Made with a non-porous oil resistant tube, this hose is reinforced with 2 separate braids, one of steel wire and one of rayon. The steel wire braid is grounded to provide a positive conductor for static electricity. The cover is made of neoprene, and is colored bright yellow, so the hose can easily be seen in mines and other dark places. Available with either high pressure re-attachable or pressed-on hydraulic fittings, this hose is made in ⅜-inch to 2-inch inside diameter sizes.

Sponge Rubber Bath Toys

Virginia Hall, Inc. of Macon, Ga., has introduced a new line of sponge rubber bath toys based on Walt Disney character creations. Now available are toys based on Mickey Mouse, Donald Duck, Pluto, Dumbo and Cleo. The toys are dyed with non-toxic colors and come wrapped in a transparent bag.

Ray-Man CBL Rotary Hose

A new type of rotary hose has been announced by the Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J., to withstand 5,000 pounds of test pressure. It is known as the "Ray-Man CBL Rotary Hose," and is made with a special cable wire insertion.



Features claimed after prolonged field tests are extreme flexibility and strength with a high factor of safety. It also has a synthetic oil-proof rubber tube for drilling-in with oil or oil-base mud. Another feature of the new hose is a built-in streamlined coupling with a "Lip-Lok" leakproof seal.

Scot Everlevel Rubber Heel

Scot Rubber Co., Inc., Port Washington, N. Y., has introduced the "Everlevel Heel" which features a "snap-on-lift". This detachable lift may be rotated so that four different wear points are provided, thus providing a heel that is always level. The lift is simply removed by breaking the suction which holds it in place. Also, it snaps on easily with a permanent grip. The lift wil fit either the right or the left shoe and will not kick off, the company states. The detachable feature of the lift, Scot Rubber claims, means that when it has been worn out, only the lift itself need be replaced, instead of the whole heel.

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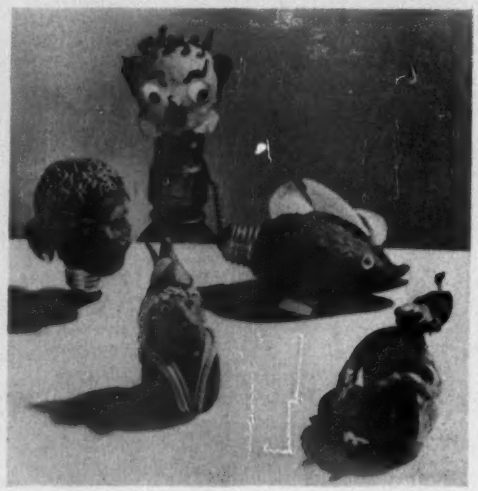
Pyrocon Modeling Plastic

A new modeling plastic based on Vinylite resins, called "Pyrocon," is now being produced by the General Glaze Corp., Baltimore, Md. The material is usable over and over again unless it is baked into a permanent shape. Advantages claimed for Pyrocon include ease of handling and an absence of stickiness. The modeling plastic is available in different size kits each of which contain a series of forms which the manufacturer calls



"basic shapes". These may be twisted and manipulated so as to yield animals, persons or objects of an almost limitless variety. Should the user create a Pyrocon item that he wants to render permanent, baking that object for about 15 minutes at 350° F. will turn the trick. Pyrocon comes in white, red, yellow, blue, green, terra cotta and black colors which may be blended by hand kneading to create complementary values. The colors remain fast during and after the baking process.

Flexi-Spray Sprinkler

A new flexible green vinyl plastic sprinkler that can be adjusted to any desired length has been announced by the Hose Sales Department of the Industrial Products Division, Goodyear Tire & Rubber Co. Featuring a solid red plastic reel which serves a dual role as a compact, permanent storage unit and as a positive action cut-off valve, the new sprinkler is said to enable gardeners to water any desired area in garden or lawn. Where the full length of the hose is not needed, water can be stopped easily and quickly at any given point on the sprinkler by simply folding the hose and inserting the fold in a special slot on the reel. Called "Flexi-Spray," the sprinkler is produced in 20, 35 and 50 foot lengths. It has eight jet water-spray openings around its circumference at 10 inch intervals, which provide a saturation pattern of water on both sides and along the length of the hose. Using the hose is simply a matter of attaching one end to a garden hose or faucet. The open end design eliminates the need for troublesome screens and filters because the hose can be easily flushed, the company states. Fifty feet of the vinyl hose wrapped on the red plastic reel weighs only 1.3 pounds.

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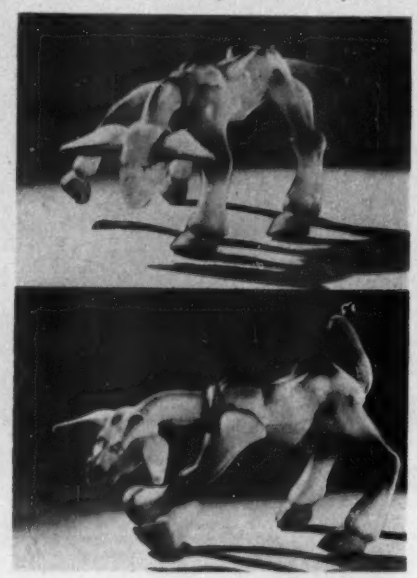
Lazy Bones Foam Rubber Toy

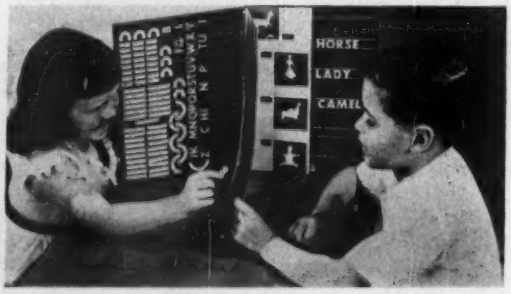
Ben-Her Industries, Inc., has introduced "Lazy Bones," a new foam rubber wired toy which can be bent into any position. The toy is buoyant, can float in water, and is colored in non-toxic paints. Lazy Bones stands



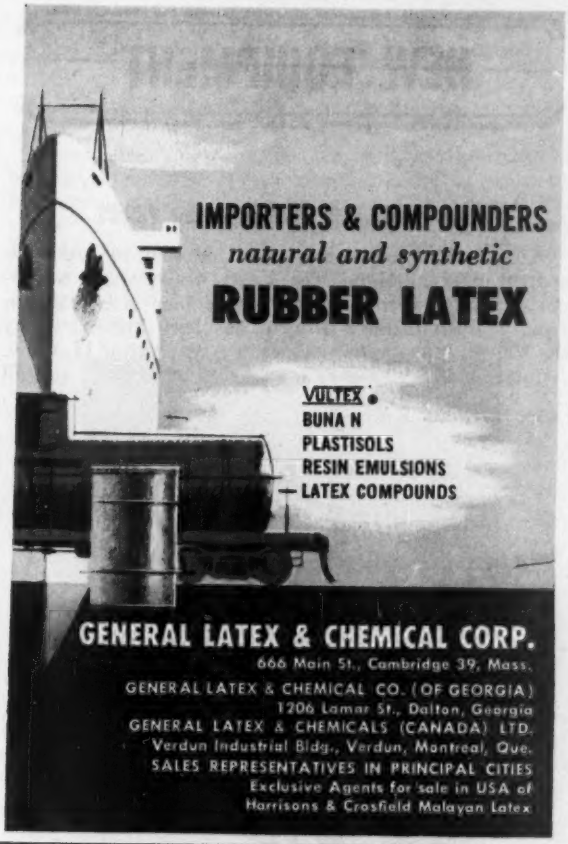
6 inches high and is 11 inches long. The toy comes in various color combinations. The accompanying photograph shows only two of the many poses which Lazy Bones can assume.

Colorform Alphabetics

Colorforms, Englewood, N. J., has introduced a new game with which pre-school children and first graders can learn the alphabet with neat, colorful stick-on designs made of Krene. With numerous stick-ons in five basic letter shapes, all alphabet letters can be built up without the mess or fuss caused by crayons or paste, the company states. Krene vinyl film resists moisture, grease, oils and tearing and may be cleaned with a damp



cloth. Stick-ons adhere only to a glossy surface and have no sticky liquid or gummy surface to pick up dirt. More than 100 parts for letter building and whole letters for word building are contained in a large spiral bound book with 32 colored pages of text and pictures to help the child learn while he plays. Stick-ons cling to the glossy page but strip off again easily and can be stuck back on many times without losing their adhesion.



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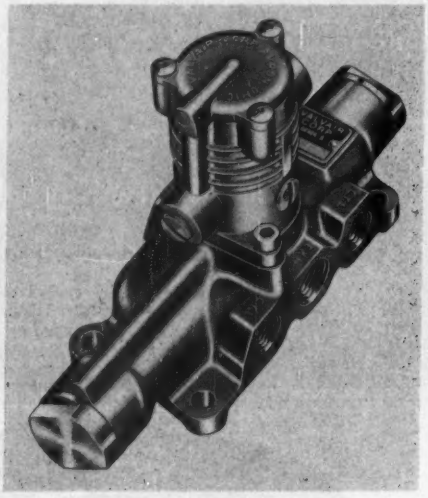
NEW EQUIPMENT

Valvair Solenoid Pilot-Operated Valves

A new, complete line of solenoid pilot-operated air control valves, designed for 3-way, 4-way and 4-way 5-port (two pressure) application in pipe sizes ranging from ¼-inch through 1 inch, has been announced by the Valvair Corporation, Morgan Ave., Akron 11, Ohio. A total of 30 new valves is included in the line, and all



types and sizes are furnished either for foot mounting or sub-base manifold mounting in accordance with J.I.C. specifications.

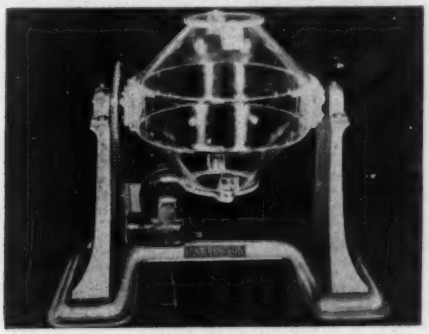
All parts of the new valves are non-corrosive. The main valve body and, also, the sub-base is cast bronze. The spool is stainless steel, hard chrome plated and polished to assure long life to the special Hycar "O" ring seals. There is no spring in the main valve, since air from the pilot valve is utilized to reverse the spool in both directions. The spool is the one moving part of the main valve body, and all parts are easily accessible without disturbing the piping to the valve.

The pilot valve control unit is manifolded with cap screws to the main valve body. An optional manual override is available for the pilot valve, which makes operation possible when electric current is off or when cylinder control set-ups are of importance. All parts of the pilot valve are totally enclosed to give the complete valve a dust-proof and splash-proof protection.

The solenoid coil is replaceable and is available in any alternating current voltage and cycle, including all direct current requirements. The maximum current consumption at any voltage is only 10 watts, assuring cool operation and long life at operating speeds as high as 600 cycles per minute. The solenoid can be held energized for any length of time without overheating and is applicable for constant or intermittent duty. Solenoid and pilot valve parts are accessible by simply removing three cap screws.

Patterson Laboratory Dry Blender

A new laboratory dry blender, designed for research and development of a wide range of blending problems, has been introduced by the Patterson Foundry and Machine Co., East Liverpool, Ohio. Called the Type L-P Blender, the new unit is made of clear, rigid plastic and is said to provide the opportunity of studying effects of changes in blending times, effects of changes in consistency of raw materials, density differences, effects of size and shape of particles, and general nature, such as adherence of particles to each other or to blender walls, particle breakage, etc.



The laboratory dry blender is complete and compact with its lightweight aluminum frame and integrally-mounted motor drive. With its diameter of 12 inches, it has a gross capacity of 0.5 cubic feet and a batch or working capacity of 0.31 cubic feet. It is capable of blending any materials weighing up to 100 pounds per cubic foot. In all cases, this unit produces an absolutely uniform blend, and the same blend which is later obtained with materials in the same proportions in large production size conical dry blenders—thus giving an accurate indication of the production blend.

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SEE PAGE 736

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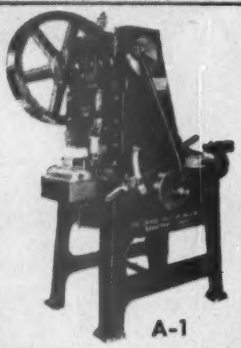
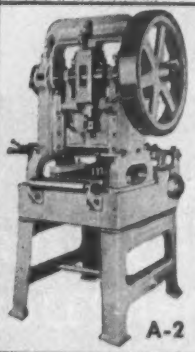


A-1



A-2

MODEL A-1

Cutting Heels at high speed production or short runs.

MODEL A-2

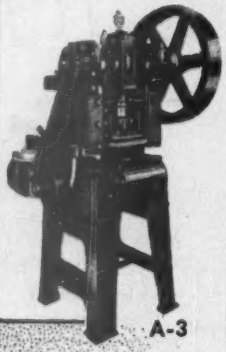
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-2s

(Not illustrated)
Cutting across grain of stock.

MODEL A-3

Cutting Multiple Heels and Taps with or across stock grain.



A-3

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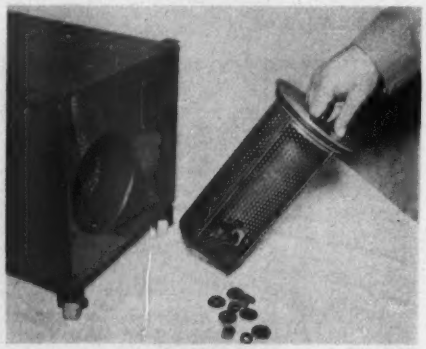
Vac-U-Pic Pick-Up Machine

The Vac-U-Pic, a specially arranged vacuum unit designed to transfer small molded items directly from the mold to a storage drawer with extreme rapidity, has been introduced by F. J. Fink & Co., 2348 Euclid Ave., Cleveland 15, Ohio. The nozzle is used when necessary to nudge the pieces out of their cavities, and since the



drawer can be emptied very rapidly into a tote box or like container or directly onto a conveyor, the unit is immediately available for use on several different moldings. The Vac-U-Pic unit is so designed that it may be readily attached to the underside of a work bench. It is self-contained and need only be plugged into a convenient 110-volt, AC outlet. It will pick up O-rings, washers, gaskets and many other kinds of small parts up to 2 inches in diameter. It is furnished as a complete unit, including motor, nozzle, hose and cord.

Free-Vane Electronic Controllers

A new line of free-vane electronic controllers has recently been announced by the Bristol Co. of Waterbury 20, Conn. The new instruments are part of the Series 500 line, and are available as indicating or recording controllers for temperature, pressure, flow, liquid level, humidity and time program control. They use the standard Bristol measuring elements. Based on a unique frequency modulation principle, the free-vane controllers are offered for low-open, high-open, low-high, low-open-high or low-normal-high control, as well as proportional input control. Various combinations of one or two recording pens or indicators with one or two control units in one case make the new controllers adaptable to a wide range of control problems.

Baldwin - Lima - Hamilton Corp., Philadelphia, Penna., has announced the **Baldwin SR-4 Load-Beam,** a highly-sensitive cantilever type load sensing device. It finds particular use in the manufacture of polyvinyl chloride resin powders where it is used to protect the mechanisms of centrifuges that separate the white flour-like powders from a water slurry in the final stages of production.

American Hydromath Corp., New York, N. Y., has developed a new circular slide rule called **Qualitrule** which is an aid in applied statistics, and particularly industrial quality control.

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Eastern Corp. also says, "The advantages of the Beta Gauge are many, such as: Elimination of tear-outs (or sampling), which previously were taken periodically to determine the accuracy of the weight; increased uniformity of basis weight; also increased production with resultant savings due to elimination of off-weight paper and faster weight changes. The instrument has proven to be very satisfactory and the Machine Tenders have absolute faith in it. The running weight of the sheet is constantly recorded and if any variation occurs, changes can be made immediately."

Tracerlab Beta Gauges are now cutting costs and increasing quality in many sheet processing plants . . . paper, rubber, floor and roof covering, plastic, tape, laminated products, metal foils . . . and on many special materials. Both Absorption (as shown) and Backscatter gauges, were pioneered and **first** made available to industry by Tracerlab.

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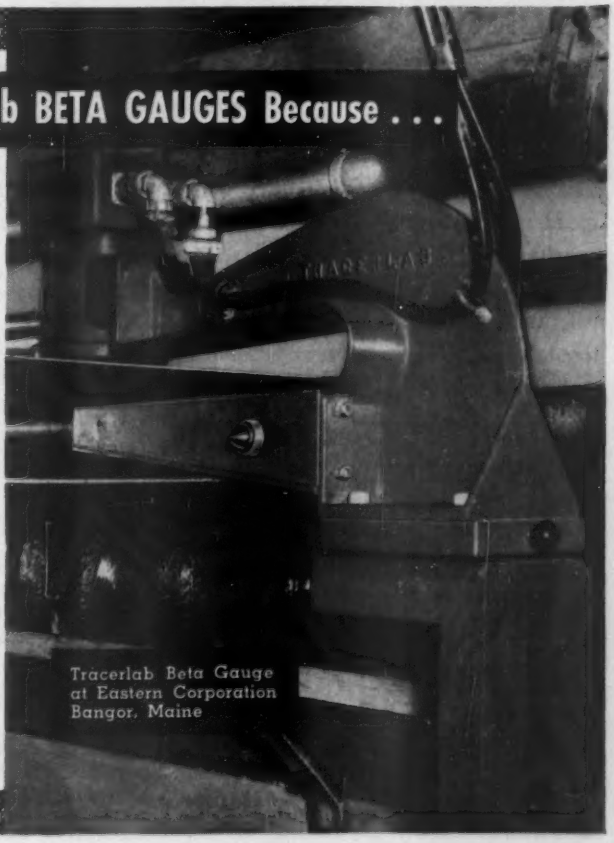

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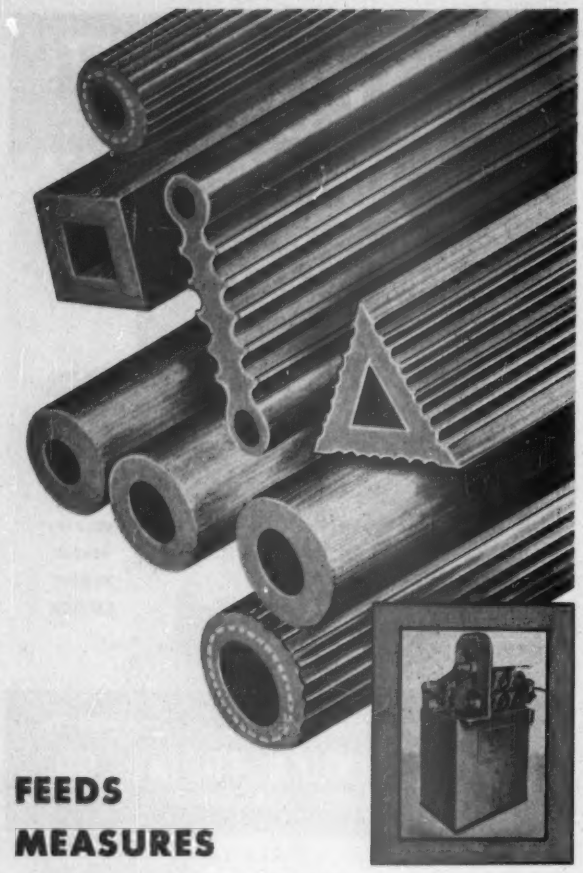

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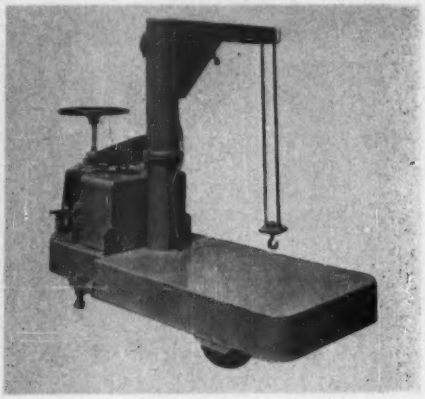
Marforge Revolving Crane Truck

Marforge, the materials handling division of the Market Forge Co., Everett, Mass., has added a revolving crane truck to its Loadmobile line. Although this unit was developed originally for use in tire plants where it removes tire molds from the vulcanizing units and replaces them again, it has also been found useful in handling other types of molds and other equipment in storage and for miscellaneous work in maintenance.



Marforge's new revolving crane truck has a capacity of 2000 pounds and an over-all height of 68 inches. Its hook, which is 60 inches high when raised and 10 inches when lowered, projects 24 inches over either side of the truck and is raised and lowered by power. The power operation is furnished by a separate pump and motor which pumps fluid into a double-acting ram inside the main mast. A double-acting ram is used so that the hook, whether loaded or empty, will lower at a safe speed and will not depend on gravity. The boom has a complete angular travel of better than 180 degrees.

The body for the revolving crane truck is a standard Loadmobile freight truck. The entire unit weighs only 4800 pounds. Specifications include a width of 36 inches, an over-all length of 92¼ inches, and a platform length of 57 inches. With a load, the unit has a speed of about 2½ to 3 m.p.h.; without a load, speed is approximately 3 to 3½ m.p.h.

Rotherm Revolving Joints

A new type of revolving joint, which incorporates all the necessary factors for complete self alignment and which is capable of handling all types of hydraulic steam and oil pressure at temperatures from —65° to 500° F., has been developed by the Rotherm Engineering Co., Inc., 7280 Devon Ave., Chicago 31, Ill. Rotating takes place on the flat face of a carbon seal, which is flexing on a ball sphere and which is pressure-sealed by an expansion thrust member. This expansion feature is accomplished by an initially spring-loaded Teflon wedge seal. This design permits the rotor to find its own rotating center and corrects all piping misalignment. Once the rotor is screwed into the roll it need never be removed. The new rotating joints are capable of handling 250 pounds steam pressure and are manufactured in sizes from ½-inch to 5 inches inclusive.

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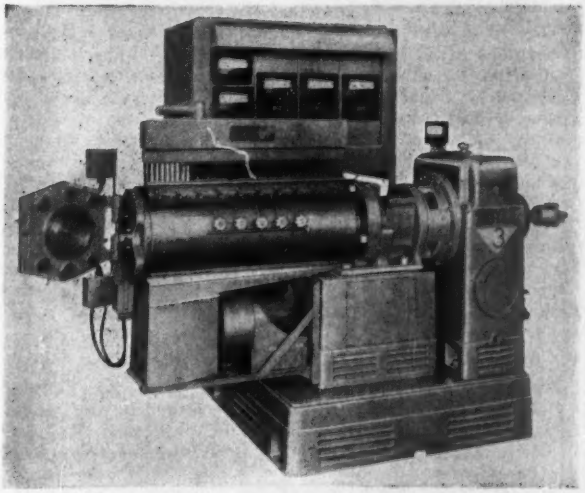

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REVIEWS

BOOKS

Symposium on Recent Developments in the Evaluation of Natural Rubber. (Technical Publication No. 136). Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 120 pp. $2.25.

Eight papers devoted to recent developments in the evaluation of natural rubber were presented in a special symposium sponsored by ASTM Committee D-11 on Rubber and Rubberlike Materials at the 1952 Annual Meeting of the society held in New York City. The program was developed by Subcommittee XII on Crude Natural Rubber of which Norman Bekkedahl, of the National Bureau of Standards, is chairman. Titles and authors of the papers, all of which are reproduced in this booklet together with the subsequent discussion, follow:

(1) Technical Classification of Crude Natural Rubber, by R. G. Newton; (2) Quantitative Procedures for the Determination of Dirt in Crude Natural Rubber, by R. P. Stock, C. O. Miserentino, C. B. McKeown, J. J. Hoesly, R. T. LaPorte, and G. H. Wallace; (3) Mooney Viscosity Measurements in Determining Processibility of Technically Classified Rubbers, by Rolla H. Taylor and Alan G. Veith; (4) Technically Classified Rubber—The Non-Rubber Content and the Measurement of Cure Rate, by A. G. Veith; (5) Vulcanization Characteristics of Natural Rubber, by Robert D. Stiehler and Frank L. Roth; (6) Preparation of a Standard Natural Rubber, by E. M. McColm; (7) Some aspects of the Testing of Crude Rubber and Crude Rubber Compounds, by L. V. Cooper and T. M. Kersker; (8) Rubber Evaluations with the Instron Testing Machine, by S. D. Gehman and R. P. Clifford. An introduction to the symposium by Mr. Bekkedahl is also included in the booklet.

•

Annual Report on the Progress of Rubber Technology: 1952. Edited by T. J. Drakeley. Published by the Institution of the Rubber Industry, 12 Whitehall, London, S.W. 1, England. 7 x 9¼ in. 166 pp. £1 1s 0d (approximately $3.00).

The latest edition of this valuable annual report covers developments in all branches of the rubber field which occurred within the calendar year of 1952. As usual, the reports were prepared by outstanding authorities and experts, with special reports devoted to statistics, cultivation, physics and chemistry, testing equipment, compounding ingredients, latex, synthetic rubber, cellular rubber, hard rubber, machinery and appliances, various types of rubber products, etc. The current edition is marked by the restoration of a report on "Works Processes and Materials" by H. W. Badger and the initiation of a report on "Roads" by L. Mullins and A. R. Smee. Although the latter report is only two and a half pages in length, it indicates the importance of the growing use of rubber in roads. As usual, anthor and subject indexes are included, credit for which is due to Dr. Drakeley.

•

Organizing for Improved Production Cost and Control. (Manufacturing Series No. 202). Published by the American Management Association, 330 West 42nd St., New York 36, N. Y. 6 x 9 in. 68 pp. $1.00 (members), $1.25 (non-members).

The papers published in this booklet were originally presented at the Manufacturing Conference sponsored by the AMA at the Hotel Statler in New York City on April 7 to 9, 1952. Papers appearing in the booklet include one on "Developing Cost Awareness," and another on "Modern Management Control of Factory Costs." Others are "A Material-Handling Improvement Program," "Organization of the Manufacturing Executive's Job," and "A Successful Maintenance Function—Elements of Organization and Control," a special panel discussion.

Formaldehyde (2nd Edition). By J. Frederic Walker. Published by Book Division, Reinhold Publishing Corp., 330 West 42nd St., New York 36, N. Y. 6 x 9 in. 575 pp. $12.00.

Although the first edition of this work was issued less than ten years ago, the production of formaldehyde in the United States alone has approximately doubled in that period. This tremendous expansion was naturally accompanied by improved methods of manufacture, new uses, and important contributions to fundamental chemistry. Comprehensive information on these new methods, applications and contributions is included in this revised edition.

Like the first edition, the new volume traces in order methods of producing formaldehyde, physical and thermodynamic properties, solutions, polymers, chemical properties, detection and analysis, and industrial applications. Sandwiched in the chapters devoted to these subjects is a special chapter devoted to hexamethylenetetramine. As the author indicates in his preface, this material, formed by the reaction of formaldehyde and ammonia, is a distinct chemical entity, and it plays an important industrial role as a special form of formaldehyde.

Specific application of formaldehyde in the rubber industry is covered in a five-page section in the chapter on "Uses of Formaldehyde." Data is included on latex, rubber derivatives, accelerators, antioxidants, and synthetic rubber. The section includes 44 bibliographical references, almost all of them devoted to patents. In all, the book has 21 chapters and author and subject indexes.

•

Handbook of Noise Measurement. By Arnold P. G. Peterson and Leo L. Beranek. Published by the General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass. 8½ x 11 in. 120 pp. $1.00.

This new handbook covers thoroughly the measurement of airborne sounds, including definitions, standards, measuring equipment, procedures, and interpretation of results. The authors are well known in the field of acoustic measurement and their treatment of the subject is based on many years' experience. The purpose of the handbook is to help those who are faced with the necessity of making sound and noise measurements. It attempts to clarify the terminology and definitions used in sound measurement, to describe the measuring instruments and their use, to aid the prospective user in selecting the proper instrument for the measurements he must make, and to show how these measurements can be interpreted to solve typical problems.

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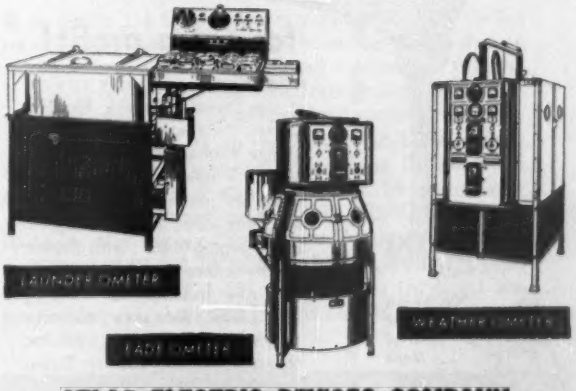

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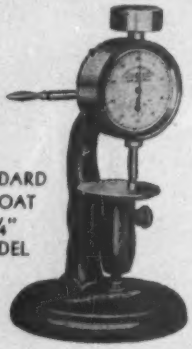

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Dispersion of Titanium Dioxide Using the Intensive Mixing Procedure. (Calco Technical Bulletin No. 906). Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J. 8½ x 11 in. 13 pp.

This technical bulletin offers a discussion of the intensive mixer operation which, as applied to the dispersion of titanium dioxide in alkyd resin vehicles, is best carried out as a series of paste "breaks" produced by addition of pigment increments until a "critical dispersion point" is reached. Further loading can be conducted to a point of maximum pigment content which has been shown to be less practical. At either point it has been demonstrated that dispersion occurs during the mixing or "break" stages and is very little improved by a lengthy kneading operation in the dough stage. Preparation of a time-loading log is highly advantageous. Following this as a guide under controlled conditions assures reproducible operation. Selection of the best titanium dioxide pigment is related to chemical modification and oil absorption characteristics. Selection of the best suited vehicle involves a consideration of structural complexity, viscosity, wetting and dispersing properties and volatile content. Alkyd resins of high structure and viscosity in the range of Z to Z_3 appear to provide good intensive mixer dispersion characteristics. By selection of the best pigment, an efficient vehicle, having properties suitable for the surface coating required, and the most effective dispersion processing cycle, economy in time, power, and equipment may be realized.

•

Universal Flexible Metal Hose Products. (Technical Data Book U-111). Universal Metal Hose Co., 2133 South Kedzie Ave., Chicago 23, Ill. 8½ x 11 in. 24 pp.

Edited to satisfy both the engineers' and purchasing agents' want for information, this compact, yet complete, data book includes information on application, temperature ranges of various types of metal and wire braided hose, dimensions, couplings, assemblies, etc. Types of Universal Flexible Metal Hose illustrated and described include Seamless All-Metal Flexible Pressure Hose; Interlocked Suction, Blower and Conveyor Hose; Square-Locked Conduits and Flexible Spout Tubing; High Pressure Hydraulic Hose; Double Wire-Braided Hose for high pressure; Single Wire-Braided Hose for medium and low pressure; and others for special applications of vibration elimination, steam, gas stove connectors, etc.

•

Atlas Industrial Chemicals. Atlas Powder Co., Wilmington 99, Del. 8½ x 11 in. 8 pp.

This new catalog of chemicals offers data on seven classes of Atlas industrial chemicals—sorbitol, surfactants, mannitol, solid polyester resins, fatty acids, plasticizers, and activated carbons. Atlas surfactants (emulsifiers, wetting agents, spreading agents, solubilizers, detergents, penetrants and anti-foaming agents) are listed. Among other groups of Atlas industrial chemicals listed are the "Atlac" polyester resins for bonding, laminating and plastic preforms; "Hystrene" hydrogenated fatty acids; the "Pycal" plasticizers for cloth coatings, industrial finishes, resins, molded articles and synthetic rubbers, and others.

•

Blaw-Knox Resin Equipment. (Bulletin 2414). Process and Equipment Department, Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Penna. 8½ x 11 in. 24 pp.

Factors important in the design of resin plants, from pilot to full scale units, are analyzed in this bulletin. In addition to designing resin plants, Blaw-Knox also specializes in the procurement and erection of these plants. The bulletin goes into detail on design problems such as materials of construction; instrumentation; agitation; and methods of heating and cooling. Preliminary design questionnaires are included for the convenience of prospective purchasers.

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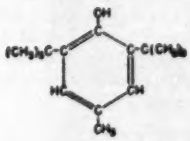

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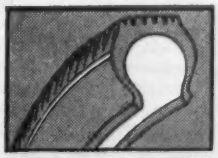

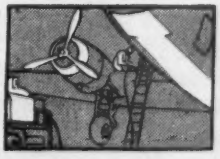

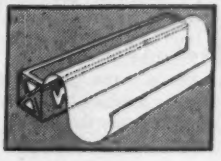

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FOR FURTHER INFORMATION, write for your copy of Bulletin C-3-115. It describes in detail the properties, reactions and uses of DBPC.

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REVIEWS (CONT'D)

E-S-E-N: Retarder or Antiscorch for Processing Safety. (Compounding Research Report No. 23). Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, Conn. 8½ x 11 in. 12 pp.

The chemical composition and physical properties of E-S-E-N, the phthalic anhydride material recently introduced by the company as a general antiscorch in all stocks with all accelerators, are outlined in this technical report, with particular emphasis on processing safety. The use of the material in typical compounds is discussed, with formulas and physicals shown in each instance. Among compounds included are non-black natural rubber stocks, carbon black-loaded natural rubber stocks, air-cured footwear stocks, black molded GR-S, and Butyl rubber tire curing bag stocks. Some data on the use of E-S-E-N as a retarder in Paracril stocks, in comparison with salicylic acid, is also given.

•

Cellusuede Flock. Cellusuede Products, Inc., 500 N. Madison Ave., Rockford, Ill. 8½ x 11 in. 12 pp.

The wide variety of uses and methods of application for decorator flock are outlined in this bulletin which is designed to provide valuable general information to design and applications engineers as well as others who wish to explore the uses of flock or plan new improved production methods. The contents include a description of the various types of flock fibers and their wide range of uses, an explanation of proper adhesive selection and application, and a discussion of the principal methods of applying flock to a surface, complete with schematic drawings and illustrations. A ready-reference chart is included to provide complete physical properties and characteristics of cotton and viscose rayon fibers.

•

Thiokol Liquid Polymer-Epoxy Resin Combinations. Thiokol Chemical Corp., 780 North Clinton Ave., Trenton 7, N. J. 9½ x 11¾ in. 9 pp.

Preliminary formulas and applications for liquid polymer-epoxy resin combinations, a new development in the potting, adhesive and coating fields, have been assembled in this portfolio. Formulas and physical characteristics are given for combinations of Thiokol with such epoxy resins as Bakelite's BRR 18794, Ciba's Araldite CN 503 and Shell Chemical's Epon 828. Compounded with these epoxy resins are Thiokol Liquid Polymers LP-3 and LP-33. Brief reports in the portfolio include one on a "Victoreen" multi-vibrator assembly embedded in a compound of Thiokol liquid polymer-epoxy resin.

•

Continex FEF in Natural and Chemical Rubbers. (Bulletin No. 53-5). Witco Chemical Co., 260 Madison Ave., New York 16, N. Y. 8½ x 11 in. 16 pp.

This new bulletin covers the properties of Continex FEF, as compared with competitive FEF blacks, in natural rubber, regular GR-S, low-temperature GR-S, Butyl, Hycar, and neoprene (Types GN and W). Characteristics compared include tensile strength; modulus at 200, 300 and 400%; ultimate elongation; hardness (°Shore instantaneous); rebound (Lupke); extrusion rate; mill shrinkage; Mooney plasticity, and Mooney scorch. The bulletin is published in both standard and metric system versions (Bulletin No. 53-6).

•

Velan Steam Traps. (Catalog No. 500). Velan Engineering, Ltd., 6585 Jeanne Mance St., Montreal, Que., Canada. 8½ x 11 in. 16 pp.

Flow and capacity charts for the various types of Universal Velan Steam Traps are contained in this new bulletin. An interesting feature of this publication is a chart which lists those features and technical qualifications which a buyer should look for in traps. Other sections of the bulletin describe the different units produced by the company. Many of the units are pictured in cutaway drawings, while the text material points out features and describes the manner in which the traps operate.

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MARKETS

NEWS-PRICES

NEW YORK, SEPT. 15, 1953

Raw Rubber

Natural: Since our last report (August 11), the average price of spot rubber on the New York Commodity Exchange has moved in a range of 1.63c, high for the period being 23.88c reached on August 20, and low being 22.25c reached on August 27. The average price of spot rubber for the month of August was 23.36c based on 21 trading days. This compares with an average of 23.66c in July.

While there are still any number of factors which may continue to militate against a price improvement in natural rubber, there is a great deal of evidence that the bearish influences have been substantially discounted in the market. Among restraining factors is the pressure of nearby rubber and the apparent eagerness of the estates to sell nearby shipment rubber, as well as the fact that the rate of consumption in the U. S. is running slower than in the first half of the year.

However, there is the possibility that offerings of rotation rubber will be confined to nearby only and not far forward delivery. The possibility of lower synthetic production also exists. Official Washington may see fit to aid the economy of the Far East in one way or another, and this may take the form of a higher price for rubber. The general realization that natural rubber is selling for less than GR-S may also be translated in a progressive increase in demand for natural rubber, especially since the price of GR-S may be advanced in the near future.

Synthetic: In a recent address, Representative Paul W. Shafer (Rep., Mich.), chairman of the House Armed Services sub-committee, stated that he doubts whether the government will be able to sell its synthetic rubber facilities under the disposal law enacted by the last session of Congress. He said that Senate democrats, despite "high sounding phrases" to the contrary, really oppose the sale.

Companies which bid for the plants, Mr. Shafer predicted, will be assailed in Congress with cries of "giveaway, monopoly, favored few, the big four, the oil lobby," and other epithets used to denounce big business. Congress, he said, passed a bad disposal law, containing "inconsistencies, over-shadowed by unrealistic requirements and practically begging for political log rolling. I would be less than candid if I did not tell you that I have doubts as to whether there will ever be anything sold under this act," he declared.

The U. S. Department of Commerce estimates that in the first seven months of this year, 443,479 long tons of GR-S were produced, against the 394,456 long tons produced in the first seven months of the preceding year. Consumption of GR-S in the first seven months of 1953 is estimated at 403,140 long tons, contrasted with the 387,476 long tons consumed in the comparable period of 1952. In the first seven months of this year, 4,286 long tons of GR-S were exported, compared with 8,015 in the first seven months of 1952.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM AUGUST 12 TO SEPTEMBER 15

Aug.	Spot	Sept.	Dec.	Mar.	May	Sales
12	23.38	23.00	23.00	22.80	22.75	44
13	23.38	23.10	22.95	22.80	22.80	5
14	23.38	23.05	23.00	22.85	22.81	11
15	——	——	——	——	——	——
16	——	——	——	——	——	——
17	23.50	23.20	23.10	23.05	23.05	19
18	23.75	23.65	23.60	23.65	23.60	90
19	23.62	23.25	23.40	23.35	23.40	9
20	23.88	23.60	23.64	23.60	23.60	24
21	23.50	23.20	23.20	23.25	23.25	20
22	——	——	——	——	——	——
23	——	——	——	——	——	——
24	23.38	23.00	23.00	22.95	22.95	3
25	23.38	22.95	22.95	23.10	23.10	14
26	23.38	23.05	23.00	22.90	22.90	3
27	22.25	23.00	23.00	23.00	23.00	44
28	23.12	22.90	22.95	22.90	22.90	32
29	——	——	——	——	——	——
30	——	——	——	——	——	——
31	23.25	23.00	23.00	23.00	23.00	29
Sept.						
1	23.12	22.85	22.85	22.85	22.80	3
2	23.25	22.90	22.95	22.90	22.85	18
3	23.25	22.95	23.00	23.00	23.00	10
4	23.38	23.20	23.25	23.25	23.25	22
5	——	——	——	——	——	——
6	——	——	——	——	——	——
7	——	——	——	——	——	——
8	23.50	23.15	23.30	23.20	23.20	233
9	23.25	23.10	23.15	23.05	23.05	20
10	23.12	22.75	23.00	23.00	22.90	0
11	23.12	——	23.10	23.10	23.00	4
12	——	——	——	——	——	——
13	——	——	——	——	——	——
14	23.38	——	23.35	23.25	23.20	23
15	23.38	——	23.35	23.25	23.25	3

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.23⅜
October	.23⅜
November	.22⅜
Thin Latex Crepe:	
Spot	.25½
Thin Brown Crepe, No. 2	.19¾
Smoked Blankets	.19⅜
Flat Bark Crepe	.17½

London Market

(Standard Smoked Sheets)

October	22.46 - 22.60
Jan. - Mar.	22.90 - 23.04

Singapore Market

(Standard Smoked Sheets)

October	22.29 - 21.36

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	3.15 -4.00
G-E Silicone Gum (not compounded)	—— -4.48
GR-I	—— - .220
GR-S	—— - .230
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types AC and CG	—— - .550
Neoprene Type GN	—— - .410
Neoprene Type GN-A	—— - .410
Neoprene Type GRT	—— - .420
Neoprene Type KNR	—— - .750
Neoprene Type Q	—— -1.00
Neoprene Type S	—— - .420
Neoprene Type W	—— - .410
Neoprene Type WRT	—— - .450
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Silastic (compounded)	2.35 -4.40
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

Middling Upland Quotations

	Aug. 11	Sept. 15		
	Close	High	Low	Close
Oct.	33.59	33.18	33.11	33.11
Dec.	33.80	33.45	33.36	33.36
Mar.	33.93	33.81	33.71	33.71

Liquid Latex

Natural: May and June consumption of Hevea latex declined from the previous four months' monthly average of about 6,000 tons, according to Latex & Rubber, Inc. July and August were expected to be still lower because of annual plant shutdowns and vacations. Estimates for the remainder of 1953 indicate expected U. S. consumption to be on the order of 5,500 tons monthly, with continuing increases beyond.

For the past 60 days, "spot" prices for Hevea latex in bulk have ranged from 32 to 36c a pound solids from primary importers. Futures deliveries from the last quarter 1953 and first quarter 1954 have sold at discounts from "spot" levels. With latex prices still linked to prices of No. 1 Ribbed Smoked Sheet, it is difficult to forecast price expectancies. As rubber moves, so will latex prices rise or fall.

Synthetic: It is estimated that 4,080 long tons of GR-S latex were produced in July, against the 4,552 long tons produced in the previous month. During July, 251 long tons were imported, contrasted with the 232 tons imported during the preceding month. Consumption in July has been estimated at 4,054 long tons, while 4,008 long tons of GR-S latex were consumed in June. As of July 31, there were 5,959 long tons of GR-S latex on hand.

The U. S. Department of Commerce estimates that 571 long tons of neoprene latex were produced in July and 526 long tons consumed. At the end of the month, there were 1,161 long tons on hand. Acrylonitrile latices produced during July totaled 466 long tons, while 345 long tons were consumed. As of July 31, there were 506 long tons of acrylonitrile latices on hand.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in the very narrow range of .20c since our last report, high for the period being 33.85c reached on August 26 and again on September 2, and low being 33.65c reached on August 17 and 24. The average price of middling uplands for the month of August was 33.82c based on 21 trading days. This compares with an average of 34.20c in the previous month.

The Department of Agriculture Estimates that the largest cotton supply since the 1949-50 marketing year is in prospect for the 1953-54 season. The department estimates that 1953-54 supply as 20,200,000 running bales, including this year's crop of 14,500,000 running bales, a carryover of 5,500,000 bales and imports of 200,000 bales.

The August 1 carryover of 5,500,000 bales was about 2,700,000 larger than the year before, and the largest since August 1, 1950. The Commodity Credit Corp., which finances the government price support program, held about 2,000,000 bales, or 36%, of the August 1 carryover.

"Disappearance" in 1953-54 is estimated at 12,200,000 to 13,500,000 bales, indicating a carryover as of August 1, 1954, of 6,700,000 bales. Thus, the actual supply would be 150 to 166% of disappearance. Disappearance includes domestic consumption and exports. Under farm law, when the supply exceeds 130% of disappearance, the Secretary of Agriculture must proclaim marketing quotas for the following crop.

MARKETS

NEWS-PRICES

NEW YORK, SEPT. 15, 1953

Reclaimed Rubber

According to the U. S. Department of Commerce, production of reclaimed rubber in July totaled 22,879 long tons, compared with the 26,315 long tons produced in the previous month. Consumption of reclaim in July is estimated at 23,358 long tons, against the 24,637 long tons consumed in June. The department estimates that 963 tons of reclaimed rubber were exported during July, one ton more than in the preceding month. As of July 30, there were 31,531 long tons of reclaimed rubber in stocks on hand.

The trade reports that business during the past month has been rather slow. The price structure remains at the levels maintained for the past few months. The sentiment seems to be that there will be some improvement in business during the remaining months of this year. It is doubted, however, if the volume in the second half of the year will approach the first half. Current prices follow:

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.12½
S.P. Natural Rubber Black Tube	.16
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.24¼
Natural Rubber Gray Tube	.24¼

Tire Fabrics

The Bureau of the Census reports that increases in synthetic tire cord production in the second quarter of this year, as compared to the second quarter of the previous year, almost exactly offset losses in cotton tire cord output. Production of rayon tire cord rose 19% to 118,700,000 pounds in the second quarter, and output of nylon cord nearly trebled, reaching 4,000,000 pounds.

During the same period, cotton tire cord production fell to 21,500,000 pounds, about half of that recorded in the second quarter of the previous year. Total production of tire cord in the second quarter of 1953 rose less than 1% to 140,000,000 pounds. Woven cotton tire cord fabric, except chafers, dropped 70% to 5,700,000 pounds. Chafer fabric rose 50% during the period to 15,800,000 pounds. Current prices follow:

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73

Nylon Tire Cord

210	lb.	2.00
840	lb.	2.00

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½

Cotton Chafers

14.4 oz. (per square yard)	lb.	.72
9.25 oz. (per square yard)	lb.	.68½
11.65 oz. (per square yard)	lb.	.65
8.9 oz. (per square yard)	lb.	.70

Scrap Rubber

Trading in the scrap rubber market continues dull with virtually no activity taking place. Although the price schedule remains unchanged from quoted nominal levels, scrap dealers indicate that there is practically no market for tires in the East. It is believed that the situation is hardly any better at Midwestern points.

Late in August, reclaimers had still not indicated when they would place orders for September delivery. Trade sources state that September business, if and when placed, will not amount to too much. The export market is also dull. Trade sources are loathe to predict what changes, if any, can be expected before the end of the year. Current prices follow:

(Prices Delivered Akron)

Mixed tires	ton	14.00
Light colored carcass	lb.	.04¾
No. 1 peelings	ton	45.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	16.00
Truck and Bus S.A.G.	ton	16.00
Passenger S.A.G.	ton	15.00
Natural Rubber Red Tubes	lb.	.11¼
Natural Rubber Black Tubes	lb.	.04½
Butyl Rubber Tubes	lb.	.02½

Rubber

Natural - Synthetic

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Blackstone 4148

In California:
Merit Western Co.
George Steinbach
717 So. Date Avenue
Alhambra, California
Cumberland 3-1400

STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS										RE-EXPORTS		TOTAL NET IMPORTS
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule						
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Total Gross Imports Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	23,185	10,213,670	19.67	2,691	745,873	12.37	600,476	7,948	3,386,408	592,528
1938	397,640	125,373,864	14.08	11,944	4,168,127	15.58	2,508	628,886	11.19	412,092	5,652	1,799,124	406,440
1939	469,946	167,586,780	15.92	27,437*	10,467,552	17.03	2,233	463,345	9.27	499,616	13,125	5,832,618	486,491
1940	781,202	303,308,823	17.33	33,789	14,593,466	19.28	3,633*	748,007	9.31	818,624	7,060	3,197,136	811,564
1941	989,498	401,976,317	18.14	34,797*	15,965,627	20.48	4,881	1,145,767	10.48	1,029,176	5,376	2,757,872	1,023,800
1942	266,276	112,537,426	18.87	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,445	10,856	5,913,386	271,589
1943	50,358	31,369,198	27.81	1,890	1,312,202	31.00	7,678*	3,636,789	21.14	59,926	22,583	16,446,707	37,343
1944	103,847	73,908,549	31.77	3,091	2,092,211	30.22	6,701*	3,351,233	22.33	113,639	9,739	8,712,695	103,900
1945	134,408	95,814,102	31.82	4,773	3,115,853	29.14	10,040	5,963,797	26.52	149,221	9,509	7,201,746	139,712
1946	376,502	228,796,110	27.13	8,421	5,843,085	30.98	5,344	2,859,246	23.89	390,267	7,711	5,331,954	382,556
1947	691,087	306,951,814	19.83	17,542	9,787,722	24.91	2,884	1,492,825	23.11	711,513	4,121	2,354,494	707,392
1948	702,293	290,849,177	18.49	32,745	18,288,223	24.93	302	71,330	10.53	735,340	6,672	3,259,324	728,668
1949	630,808	225,343,624	15.95	29,743	14,968,650	22.47	....	.....	....	660,551	6,253	2,746,109	654,298
1950	747,109	416,222,598	24.87	54,401	41,764,486	34.27	739	254,331	15.37	802,249	8,640	6,832,821	793,609
1951	677,874	727,343,348	47.90	54,963	80,178,309	65.12	1,619	1,258,941	34.71	734,456	2,603	3,947,740	731,853
1952	756,987	578,179,519	34.09	48,228	40,563,116	37.55	782	358,095	20.44	805,997	3,024	2,592,099	802,973
1952:													
May	55,764	45,898,163	36.74	3,409	3,140,619	41.12	15	7,644	22.62	59,188	130	150,568	59,058
June	62,744	48,168,471	34.27	4,445	3,934,931	30.62	74	28,985	16.85	67,263	1,555	190,975	65,708
July	45,718	30,026,066	29.32	2,295	2,378,572	33.74	412	153,855	16.66	48,425	135	128,437	48,290
Aug.	62,455	37,485,360	26.79	4,684	3,513,319	33.49	....	.....	....	67,139	373	278,927	66,766
Sept.	47,696	28,223,624	26.42	3,813	2,771,909	32.45	....	.....	....	51,509	279	202,978	51,230
Oct.	50,762	29,340,768	25.84	4,890	3,272,571	29.88	....	.....	....	55,652	337	248,642	55,315
Nov.	44,458	24,209,723	24.32	4,321	2,866,961	29.62	....	.....	....	48,779	585	414,704	48,194
Dec.	72,160	38,104,339	23.57	6,032	3,817,116	28.25	....	.....	....	78,192	615	417,656	77,577
1953:													
Jan.	57,516	31,296,490	24.29	6,250	4,168,234	29.77	....	.....	....	63,766	528	375,052	63,238
Feb.	42,562	24,336,087	25.80	6,338	4,480,115	31.55	....	.....	....	48,900	981	663,761	47,919
Mar.	50,115	28,724,364	25.59	6,671	4,733,320	31.68	....	.....	....	56,786	605	435,030	56,181
Apr.	54,272	29,729,394	24.45	6,302	4,206,828	29.80	....	.....	....	60,574	692	446,231	59,882
May	50,452	25,495,937	22.56	5,674	3,609,808	28.40	....	.....	....	56,126	521	334,048	55,605

Source: Bureau of the Census, U. S. Department of Commerce. * Adjusted to agree with total gross imports.

Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule. (3) In the years 1940 through 1943, crepe sole rubber imports were reported under separate classification. Such imports, which are included under natural rubber, dry above, were: 856,294 pounds, valued at $191,097 in 1940; 379,607 pounds, valued at $85,924 in 1941; 662,303 pounds, valued at $159,530 in 1942; and 21,653 pounds, valued at $5,215 in 1943.

Natural Rubber
(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1952	805,997	453,846	3,024	95,260
1952:				
May	59,188	36,437	130	63,988
June	67,246	36,946	156	72,995
July	49,251	32,760	136	84,839
Aug.	67,139	32,941	373	86,657
Sept.	52,785	45,110	279	84,150
Oct.	55,651	45,110	337	82,861
Nov.	48,777	41,749	585	86,243
Dec.	78,148	44,790	615	95,260
1953:				
Jan.	57,517	47,766	528	97,730
Feb.	48,455	45,231	981	94,151
Mar.	36,786	50,707	605	98,627
Apr.	60,578	49,375	692	108,892
May	56,280	46,889	521	113,532
June	61,423	45,224	409	112,959
July	.....	44,023	465	119,028

Source: Rubber Division, NPA, U. S. Department of Commerce.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	.....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	.....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1952	988	762,994	1,636	2,094,983	282	385,890
1952:						
Mar.	50	43,207	128	217,096	27	43,861
Apr.	49	31,239	234	409,076	32	41,391
May	57	32,488	92	141,257	26	27,853
June	57	31,787	212	273,357	50	50,941
July	55	35,941	100	148,350	16	18,422
Aug.	16	9,037	142	193,364	28	31,011
Sept.	109	51,414	148	183,692	15	12.291
Oct.	130	125,137	95	99,181	20	17.937
Nov.	176	139,154	78	67,764	18	23,392
Dec.	132	145,270	101	87,548	14	25,878
1953:						
Jan.	...	.....	77	153,276	6	10,474
Feb.	105	67,265	120	182,792	21	32,473
Mar.	84	74,828	97	83,918	22	44,791
Apr.	309	196,917	87	76,143	7	7,761
May	53	27,463	552	64,822	5	3,388

Source: U. S. Department of Commerce.

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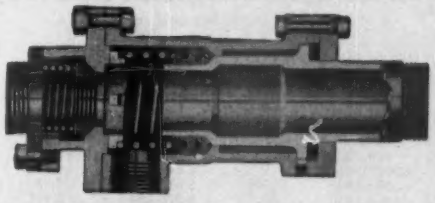

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Synthetic Rubber—Totals

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1942	22,434	.....	17,651	1,419	4,612
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,025	7,709	761,699	72,920	114,963
1947	508,702	1,093	559,566	11,385	62,366
1948	488,343	15,671	442,072	4,874	115,111
1949	393,690	17,242	414,381	6,483	98,042
1950	476,184	25,722	538,289	7,652	52,758
1951	845,159	10,085	758,897	9,249	129,912
1952	798,556	19,891	807,037	22,101	118,987
1953:					
Mar.	81,408	1,542	77,903	1,691	116,089
Apr.	82,952	1,296	77,221	1,489	122,041
May	85,302	1,058	72,234	2,274	132,109
June	80,227	919	71,751	1,769	143,789
July	79,360	990	61,382	2,021	159,443

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,599	35,215	54,046	11,072	410,932
1950	378,887	50,067	60,915	12,037	501,906
1951	704,529	58,907	76,475	15,333	855,244
1952	654,854	65,745	81,630	16,228	818,447

Consumption

1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,580	13,066	758,897
1952	666,420	55,522	71,229	13,866	807,037

Exports

1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,825	216	1,725	9,249
1952	9,467	9,813	126	2,695	22,101

Stocks at End of Period

1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,942	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,821	129,912
1952	83,861	8,535	22,716	3,875	118,987

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1946	1947	1948	1949	1950	1951	1952	1953
Jan.	51,746	57,057	61,308	63,125	66,981	80,670	86,863	89,634
Feb.	47,654	50,551	56,487	57,980	53,274	72,864	82,043	86,458
Mar.	56,703	59,947	68,171	73,282	78,780	86,962	87,065	98,158
Apr.	62,111	64,140	72,183	75,318	80,350	87,573	98,653	102,044
May	66,800	70,865	77,186	81,665	89,035	100,266	101,137	105,867
June	63,247	71,329	78,044	83,374	90,174	96,364	99,305	.....
July	60,076	73,441	81,428	83,129	91,677	100,567	105,307	.....
Aug.	66,729	72,089	80,351	84,707	94,507	101,453	102,954	.....
Sept.	62,268	71,384	76,159	80,832	86,725	91,891	100,095	.....
Oct.	66,637	73,277	75,164	79,327	89,067	100,209	103,689	.....
Nov.	61,345	64,158	72,560	76,346	82,688	88,581	91,326	.....
Dec.	61,101	67,506	72,162	75,628	81,032	84,551	95,817	.....
Total	735,417	795,015	871,270	913,713	994,290	1,091,951	1,154,254	

Source: U. S. Bureau of Mines.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude [a]	Exports	Stocks On Hand at End of Period
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007 [b]	254,820	64.6	30,405	42,532
1943	304,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	28.6	14,722	45,082
1952	274,981	280,002	22.2	11,180	30,664
1953:					
Jan.	27,258	24,696	20.5	866	31,244
Feb.	24,583	24,098	21.1	950	30,631
Mar.	27,964	27,334	21.2	1,115	30,280
Apr.	29,032	26,483	20.9	1,261	31,263
May	27,142	25,213	21.2	964	31,763
June	26,554	24,637	20.5	962	32,791
July	23,150	23,358	22.2	963	31,763

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. [a] Includes natural and synthetic rubber. [b] Includes 893 tons of imports. [c] Includes 67 tons of imports. [d] Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1933	1,573,512	346,545	1,920,057	1943	0	4,501	4,501
1934	2,177,919	575,192	2,753,111	1944	0	124,819	124,819
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	875,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1942	220,814	133,083	353,897	1952	4,320,788	1,212,390	5,533,178
1952:							
Jan.	273,639	100,993	374,632	July	168,327	43,231	211,558
Feb.	334,058	100,533	434,591	Aug.	218,577	52,056	270,633
Mar.	373,237	109,167	482,404	Sept.	438,397	112,375	550,772
Apr.	416,155	112,833	528,988	Oct.	471,808	132,064	603,872
May	398,286	105,208	503,494	Nov.	405,111	114,106	519,217
June	408,700	109,526	518,226	Dec.	418,977	115,814	534,791
1953:							
Jan.	453,319	111,599	564,918	July	599,077	105,622	704,699
Feb.	486,071	96,740	582,811	Aug.	.....	.....	.....
Mar.	566,320	134,129	700,449	Sept.	.....	.....	.....
Apr.	596,633	126,788	723,421	Oct.	.....	.....	.....
May	549,677	93,493	643,170	Nov.	.....	.....	.....
June	587,549	74,063	661,612	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

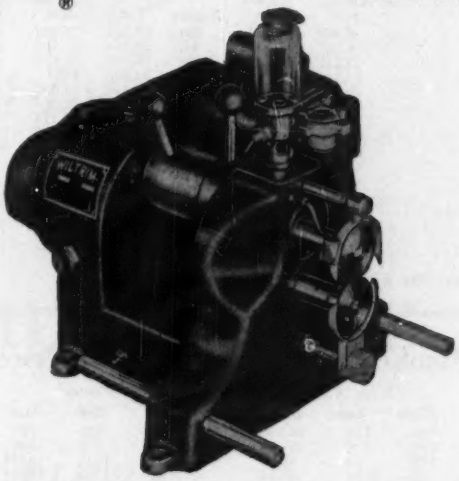
Rim Production

	1948	1949	1950	1951	1952
Passenger Car	23,842,796	27,715,344	35,096,404	29,145,367	24,936,844
Truck & Bus	6,920,231	4,238,174	6,625,129	6,877,419	5,752,674
Agricultural	3,140,882	2,695,430	2,853,483	3,019,581	2,073,116
Earth Mover	13,330	9,895	15,602	28,026	31,791
Total	33,917,239	34,658,843	44,590,618	39,070,393	32,794,425

	1953					
	Mar.	Apr.	May	June	July	Aug.
Passenger Car	3,116,429	3,059,450	2,953,694	3,087,588	2,882,348	2,425,096
Truck & Bus	634,586	532,763	442,562	342,900	380,636	399,013
Agricultural	227,518	203,706	188,430	196,957	138,098	121,468
Earth Mover	3,424	2,058	1,954	2,577	2,760	1,348
Total	3,981,957	3,797,979	3,586,640	3,360,022	3,403,842	2,946,925

Source: The Tire & Rim Association, Inc.

WILTRIM® **Model DF TRIMMER**



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for all purposes

Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1942 (total)	6,680	8,872	207	15,759	15,351	6,247
Passenger Car.	910	2,734	38	3,682	2,790	4,432
Truck and Bus	5,770	6,138	169	12,077	12,561	1,815
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car.	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	3,013
Passenger Car.	208	18,330	130	18,668	18,819	1,318
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	31,584	43,466	1,467	76,517	76,369	10,638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car.	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car.	26,729	34,226	723	61,678	65,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952 (total)	29,484	54,342	1,520	85,346	90,411	14,110
Passenger Car.	24,106	45,458	741	70,305	74,341	11,251
Truck and Bus	5,378	8,884	779	15,041	16,070	2,859
1953:						
Mar. (total)	3,570	4,598	87	8,256	9,407	16,456
Passenger Car.	3,039	3,793	41	6,874	7,918	13,364
Truck and Bus	531	805	46	1,382	1,488	3,092
Apr. (total)	3,798	5,001	115	8,913	9,262	16,872
Passenger Car.	3,290	4,265	45	7,599	7,833	13,666
Truck and Bus	508	736	70	1,314	1,429	3,207
May (total)	3,200	5,604	139	8,942	8,987	16,973
Passenger Car.	2,822	4,816	75	7,712	7,655	13,656
Truck and Bus	378	788	64	1,230	1,331	3,318
June (total)	3,537	5,601	142	9,279	8,572	16,259
Passenger Car.	3,216	4,819	75	8,111	7,311	12,852
Truck and Bus	320	782	66	1,168	1,261	3,406
July (total)	3,616	5,793	146	9,555	8,173	14,883
Passenger Car.	3,181	4,953	99	8,232	7,119	11,736
Truck and Bus	435	840	48	1,323	1,061	3,147

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton				Rayon and Nylon[b]		
	Tire Cord Not Woven	Cord Fabric Woven	Chafer and All Other Tire Fabrics	Total	Tire Cord Not Woven	Tire Cord And Other Tire Fabrics	Total
1950:							
Jan.-Mar.	3,939	19,210	12,948	36,097	12,469	60,981	73,450
Apr.-June	11,077	29,498	14,071	54,646	11,510	59,966	71,476
July-Sept.	10,529	39,792	15,101	65,152	13,161	61,614	74,775
Oct.-Dec.	13,314	37,759	14,405	65,578	12,942	63,399	76,341
Total	38,859	126,259	56,525	221,473	50,082	245,960	296,476
1951:							
Jan.-Mar.	11,497	38,269	16,737	66,503	11,878	65,512	77,390
Apr.-June	12,608	42,491	17,055	72,154	11,979	61,957	73,936
July-Sept.	16,744	44,340	17,433	78,517	12,091	67,982	80,073
Oct.-Dec.	14,237	43,820	13,899	71,956	c	83,354	83,354
Total	55,116	168,920	65,124	289,160	35,948	278,805	314,753
1952:							
Jan.-Mar.	11,226	36,378	12,971	60,575	14,434	72,249	86,683
Apr.-June	4,661	24,612	10,742	40,015	16,874	81,249	98,123
July-Sept.	335	9,257	9,460	19,052	18,128	80,355	98,483
Oct.-Dec.	c	4,728a	11,580	16,308	19,436	81,171	100,607
Total	16,223	74,975	44,753	145,950	68,872	315,024	383,896
1953:							
Jan.-Mar.	c	4,378a	15,477	19,855	20,487	91,742	112,229
Apr.-June	.....	.....	.....	.....	.....	.....	.....
July-Sept.	.....	.....	.....	.....	.....	.....	.....
Oct.-Dec.	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	.....

Source: U. S. Bureau of the Census.

Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven. (d) Included with chafer and all other tire fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
7946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	....
1951	32,151	32,284	1,071	65,507	67,249	10,094
1952	29,451	32,985	1,014	63,449	65,073	12,036
1953:						
Mar.	3,571	2,941	44	6,555	7,470	11,242
Apr.	3,797	2,896	67	6,760	7,544	12,155
May	3,200	3,315	71	6,586	6,940	12,592
June	3,539	3,298	71	6,907	7,035	12,811
July	3,614	3,600	73	7,288	6,395	12,097

Source: The Rubber Manufacturers Association, Inc.

Smoked Sheets—Spot Closing Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1911	184	114	141.30	1932	4¼	2½	3.49
1912	140	108	121.60	1933	9¾	2⅞	5.96
1913	113	59	82.04	1934	15⅝	8¾	12.92
1914	93	56	65.33	1935	13¾	10½	12.37
1915	79	58½	65.85	1936	23	13½	16.41
1916	102	55	72.50	1937	26⅛	14	19.39
1917	90	52	72.23	1938	17⅛	10¼	14.64
1918	70	40	60.15	1939	24	14¼	17.57
1919	57	38½	48.70	1940	24	18¾	20.10
1920	56½	16	36.30	1941	24¾	19½	22.40
1921	21¼	11½	16.36	1942	22½	22½	22.50
1922	28¾	13¾	17.50	1943	22½	22½	22.50
1923	37½	24¾	29.45	1944	22½	22½	22.50
1924	40¾	17¾	26.20	1945	22½	22½	22.50
1925	121	34¾	72.46	1946	22¾	22½	22.50
1926	88½	36¾	48.50	1947	25	14	20.00
1927	41¾	33	37.72	1948	25	18	21.99
1928	41¾	17	22.48	1949	19¾	15⅞	17.57
1929	26⅞	15½	20.55	1950	86	18	41.10
1930	16½	7½	11.98	1951	76	52	(a)
1931	8¾	4¾	6.17	1952*	33	26½	29.15

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year. * Free trading was resumed on July 1, 1952; figures represent only July through December, 1952.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1946	1947	1948	1949	1950	1951	1952	1953
Jan.	25.49	32.58	36.09	33.37	31.89	45.04	42.96	33.24
Feb.	26.57	33.91	33.63	33.41	32.79	(a)	41.64	33.76
Mar.	27.52	35.89	35.04	33.44	32.65	46.06	41.70	34.10
Apr.	28.40	35.89	38.10	33.84	33.23	46.06	41.79	33.85
May	28.17	36.51	38.57	33.73	33.64	46.06	39.68	34.30
June	29.89	37.83	38.12	33.56	34.61	46.06	41.31	34.11
July	34.11	38.03	34.89	32.99	38.11	41.21	40.37	34.20
Aug.	36.31	34.83	32.23	32.06	38.93	35.93	40.42	33.82
Sept.	37.59	32.21	31.92	30.94	41.62	36.20	39.75	....
Oct.	36.79	32.39	32.01	30.32	40.66	38.13	37.52	....
Nov.	31.50	34.50	32.15	30.52	43.11	42.70	35.59	....
Dec.	33.03	36.74	32.90	31.08	43.37	43.32	33.76	....
Average for Year	31.28	35.11	34.64	32.44	37.05	42.43	39.71	....

Note: The Government established a ceiling price of 45.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film	Textile and Paper Coating Resins	Molding and Extrusion Materials	All Other
1950	227,149	46,044	113,889	21,868
1951	161,547	43,688	134,890	23,934
1952	154,902	42,298	140,872	31,793
1953:				
Feb.	16,516	4,145	13,847	2,919
Mar.	17,575	4,950	14,906	3,683
Apr.	16,574	4,934	15,332	2,800
May	14,766	4,126	13,509	3,084

Source: U. S. Tariff Commission.

Note: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting. Beginning January, 1951, statistics are listed on a resin content basis.

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see Rates on Page 868

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J. J. WHITE Products Co.
7000 UNION AVENUE
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Rubber Industry Employment, Earnings and Hours

All Rubber Products

	1952				1953			
Mo.	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Jan.	210.4	$74.03	40.9	$1.81	219.2	$78.09	41.1	$1.90
Feb.	208.2	73.31	40.5	1.81	219.2	79.30	41.3	1.92
Mar.	208.0	72.54	40.3	1.80	220.5	80.29	41.6	1.93
Apr.	205.6	71.28	39.6	1.80	220.4	79.71	41.3	1.93
May	205.7	73.31	40.5	1.81	220.2	78.57	40.5	1.94
June	206.6	75.26	40.9	1.84	221.0	....	....	....
July	194.7	72.07	39.6	1.82	....	....	....	....
Aug.	203.1	73.49	40.6	1.81	....	....	....	....
Sept.	208.3	75.21	41.1	1.83	....	....	....	....
Oct.	212.5	75.53	41.5	1.82	....	....	....	....
Nov.	216.6	76.86	41.1	1.87	....	....	....	....
Dec.	219.2	79.19	41.9	1.89	....	....	....	....

Tires and Tubes

Jan.	91.3	87.12	40.9	2.13	91.5	89.24	40.2	2.22
Feb.	91.1	85.67	40.6	2.11	91.2	91.80	40.8	2.25
Mar.	90.8	83.58	39.8	2.10	91.6	93.83	41.7	2.25
Apr.	91.4	81.74	39.3	2.08	92.0	91.39	40.8	2.24
May	91.5	84.84	40.4	2.10	92.6	91.76	40.6	2.26
June	91.8	87.95	41.1	2.14	....	....	....	....
July	90.0	84.38	39.8	2.12	....	....	....	....
Aug.	88.6	85.46	40.5	2.11	....	....	....	....
Sept.	90.0	86.28	40.7	2.12	....	....	....	....
Oct.	90.2	85.88	40.7	2.11	....	....	....	....
Nov.	90.8	87.23	40.2	2.17	....	....	....	....
Dec.	91.8	90.42	41.1	2.20	....	....	....	....

Rubber Footwear

Jan.	24.1	60.15	40.1	1.50	24.5	64.96	40.1	1.62
Feb.	23.4	60.50	39.8	1.52	24.2	67.57	41.2	1.64
Mar.	22.9	61.51	40.2	1.53	24.2	67.57	41.2	1.64
Apr.	20.9	59.34	39.3	1.51	23.8	67.82	41.1	1.65
May	22.3	60.65	39.9	1.52	23.3	60.52	36.9	1.64
June	22.5	61.26	40.3	1.52	....	....	....	....
July	18.0	58.95	39.3	1.50	....	....	....	....
Aug.	22.7	61.81	40.4	1.53	....	....	....	....
Sept.	23.5	62.99	40.9	1.54	....	....	....	....
Oct.	24.3	63.71	41.1	1.55	....	....	....	....
Nov.	24.7	68.30	41.9	1.63	....	....	....	....
Dec.	25.2	66.49	41.3	1.61	....	....	....	....

All Other Rubber Products

Jan.	95.0	65.51	41.2	1.59	103.2	71.74	42.2	1.70
Feb.	93.7	64.55	40.6	1.59	103.8	71.06	41.8	1.70
Mar.	94.3	64.87	40.8	1.59	104.7	71.72	41.7	1.72
Apr.	93.3	63.84	39.9	1.60	104.6	71.72	41.7	1.72
May	91.9	65.28	40.8	1.60	104.3	70.86	41.2	1.72
June	92.3	65.85	40.9	1.61	....	....	....	....
July	86.7	62.25	39.4	1.58	....	....	....	....
Aug.	91.8	65.28	40.8	1.60	....	....	....	....
Sept.	94.8	67.65	41.5	1.63	....	....	....	....
Oct.	98.0	68.95	42.3	1.63	....	....	....	....
Nov.	101.1	69.81	41.8	1.67	....	....	....	....
Dec.	102.2	72.33	42.8	1.69	....	....	....	....

Source: U. S. Department of Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who work during, or received pay for, any part of the pay period ending nearest the 15th of the month. These employment series have been adjusted to first quarter 1951 benchmark levels indicated by data from government social insurance programs. Hours and earnings data pertain only to production and related workers.

Production Index for the Rubber Industry

Production 1935-1939 = 100 (Based on man-hours)

	1951	1952	1953		1951	1952	1953
Jan.	244	248	268	July	243	225	....
Feb.	235	243	270	Aug.	243	242	....
Mar.	239	242	275	Sept.	245	252	....
Apr.	238	235	272	Oct.	239	260	....
May	247	242	269	Nov.	245	264	....
June	251	246	....	Dec.	250	272	....

Source: U. S. Department of Commerce.

Sales by the Rubber Industry

(In Millions of Dollars)

	1951	1952	1953		1951	1952	1953
Jan.	454	468	507	July	438	408	....
Feb.	434	442	499	Aug.	467	452	....
Mar.	459	406	510	Sept.	435	482	....
Apr.	439	437	508	Oct.	445	464	....
May	432	424	472	Nov.	438	403	....
June	433	430	....	Dec.	363	438	....

Source: U. S. Department of Commerce.
Note: Figures have been revised to conform to new benchmark levels.

Rubber Manufacturers' Inventories

(Based upon Book-Value) (In Millions of Dollars)

	1951	1952	1953		1951	1952	1953
Jan.	562	840	915	July	616	884	....
Feb.	555	848	887	Aug.	640	884	....
Mar.	554	865	903	Sept.	659	877	....
Apr.	565	877	916	Oct.	705	874	....
May	583	878	924	Nov.	739	897	....
June	610	864	....	Dec.	799	936	....

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1945	1946	1947	1948	1949	1950	1951
Antimony, Primary:							
Short tons	.....	.....	39	41	55	103 [c]	19 [c]
% of total	.....	.....	.002	.003	.005	.007	.001
Asphalt: [a]							
Short tons	19,483	28,715	32,113	19,967	18,050	26,819	21,414
% of total	.005	.007	.007	.004	.003	.003	.003
Barite (Barytes):							
Short tons	10,000	20,000	17,000	18,000	14,000	19,000	15,000
% of total	2.1	4.4	3.1	2.85	2.53	3.31	2.13
Carbon Black:							
Short tons	402,193	470,732	471,790	435,282	383,565	515,184	530,614
% of total	95.5	95.3	94.3	95.5	93.3	92.9	92.9
Clay, Kaolin:							
Short tons	109,936	162,393	166,201	176,965	197,341	263,306	231,331
% of total	11.7	12.3	11.5	11.3	13.1	15.0	12.7
Clay, Fire & Stoneware:							
Short tons	7,800	12,951	17,970	15,480	27,148	9,500	.....
% of total	0.1	0.2	0.2	0.2	0.3	0.1	.....
Lime:							
Short tons	7,170	3,193	589	1,154	715	908	.....
% of total	0.12	0.05	0.01	0.02	.0002	.0002	.....
Litharge:							
Short tons	1,864	2,131	1,205	2,835	1,398	3,047	2,641
% of total	1.3	1.6	1.3	1.8	1.2	1.7	1.7
Lithopone:							
Short tons	977	1,607	3,085	4,192	3,245	4,092	3,295
% of total	0.7	1.1	1.9	3.0	4.1	3.9	3.2
Mica, Ground:							
Short tons	3,715	4,951	3,900	4,372	3,856	5,776	6,551
% of total	7.1	8.0	6.0	7.0	7.0	8.0	9.0
Sulfur:							
Short tons	64,960	72,800	72,800	70,000	59,360	75,000	.....
% of total	2.0	2.2	1.8	1.7	1.5	1.3	.....
Talc: [b]							
Short tons	63,758*	65,980	71,840	66,226	53,400	75,900	70,970
% of total	16.0	14.4	13.9	13.0	12.0	12.0	11.2
Zinc Oxide:							
Short tons	63,447	83,776	82,248	82,895	58,496	82,944	71,507
% of total	49.6	53.1	51.2	54.9	52.5	51.6	48.5

Source: U. S. Bureau of Mines.
Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes prophyllite and ground soapstone. (c) Does not include precipitated antimony sulfide as in previous years. * Revised.

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16 x 40" (several)
16 x 30"
16 x 24"
6 x 12" (used lab)
6 x 12" (new lab)
8 x 18"
10 x 24"

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36 x 36", 30" ram
30 x 54", 30" ram
24 x 24", 12" ram
24 x 24", 14" ram
30 x 30", 16" ram
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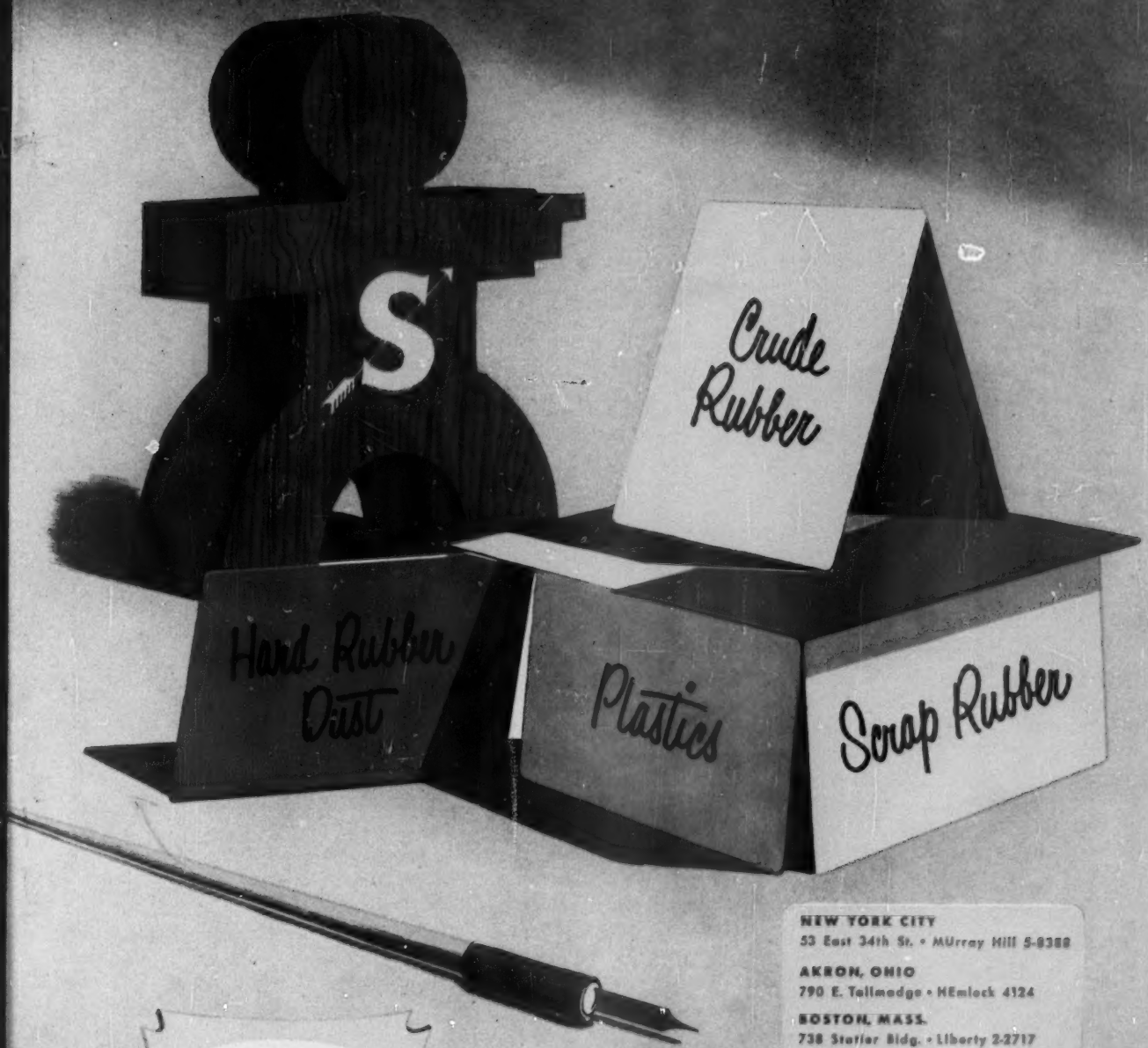

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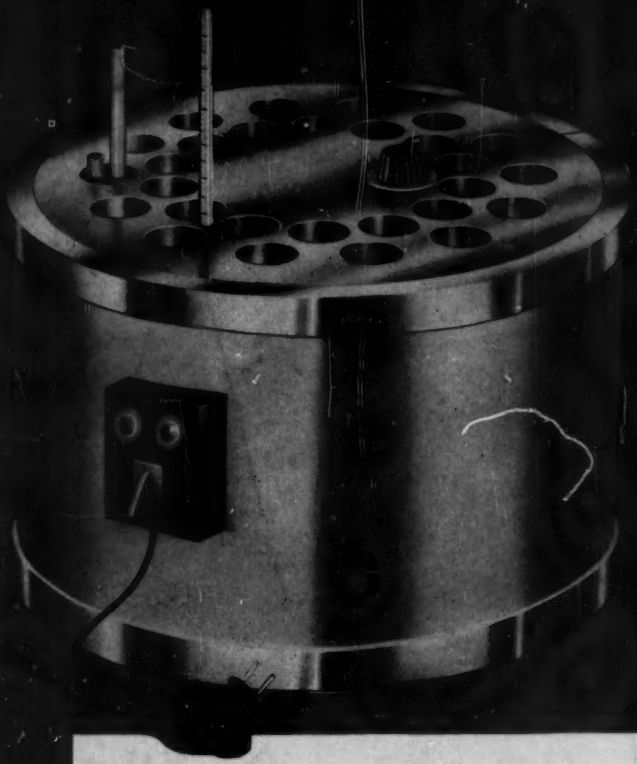

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